

Figure 1 A

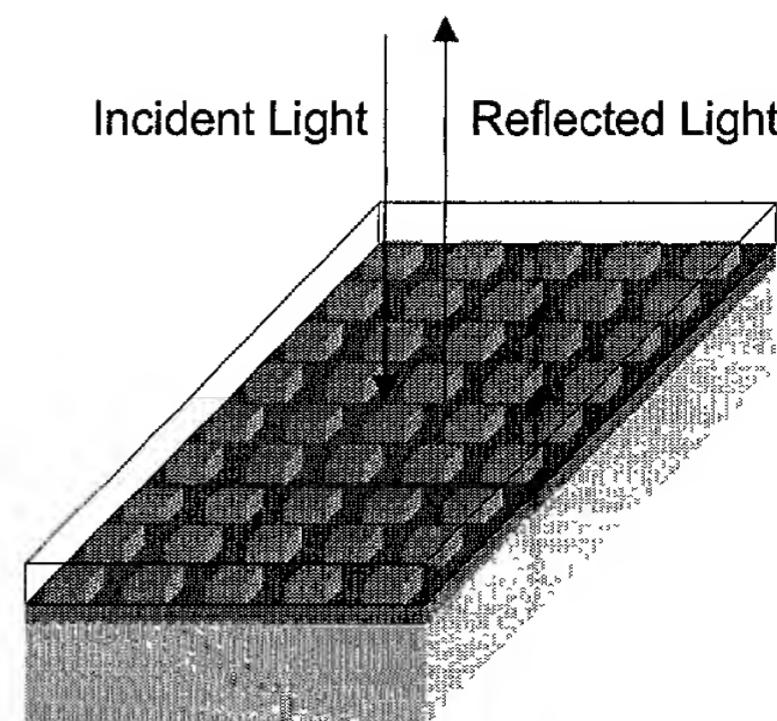


Figure 1 B

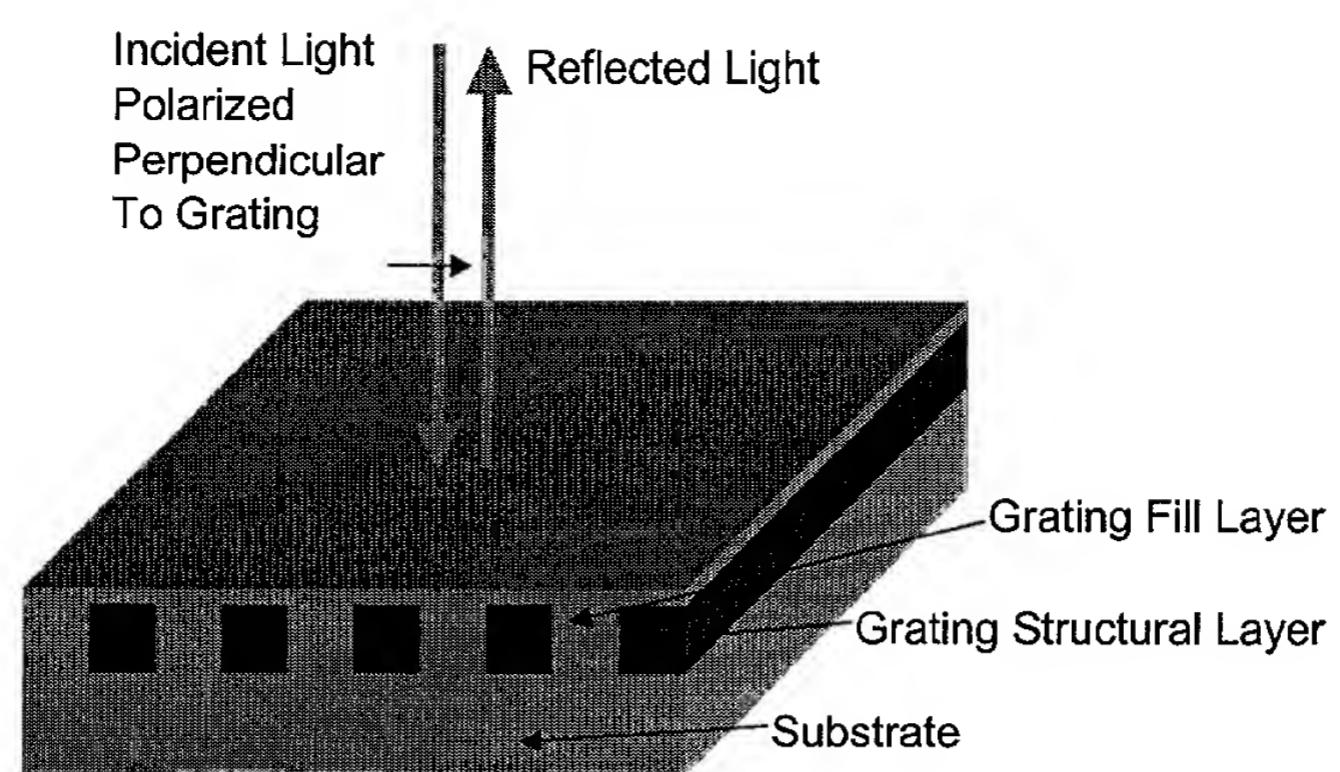


Figure 2.

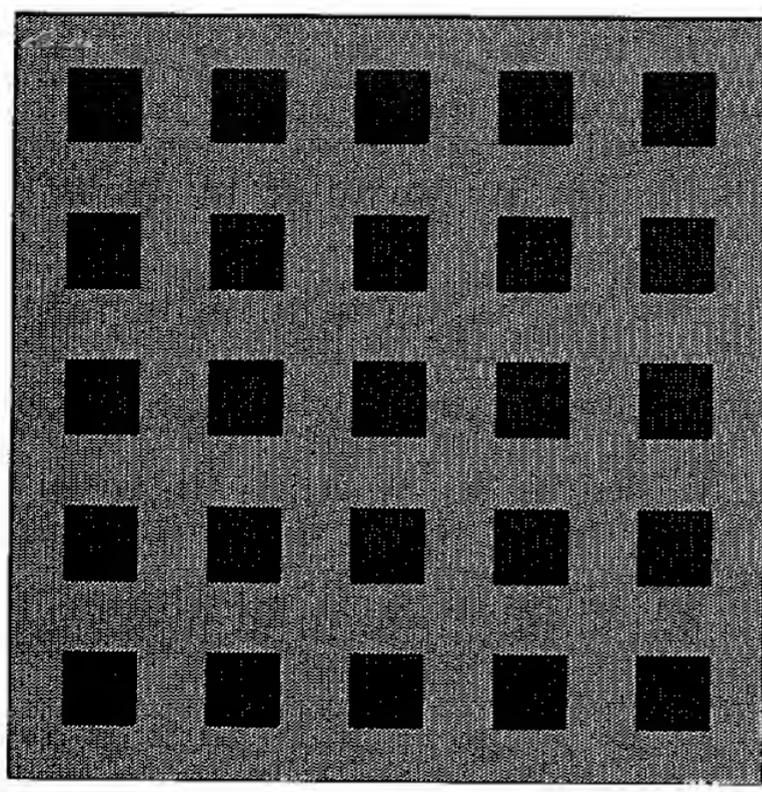


Figure 3A

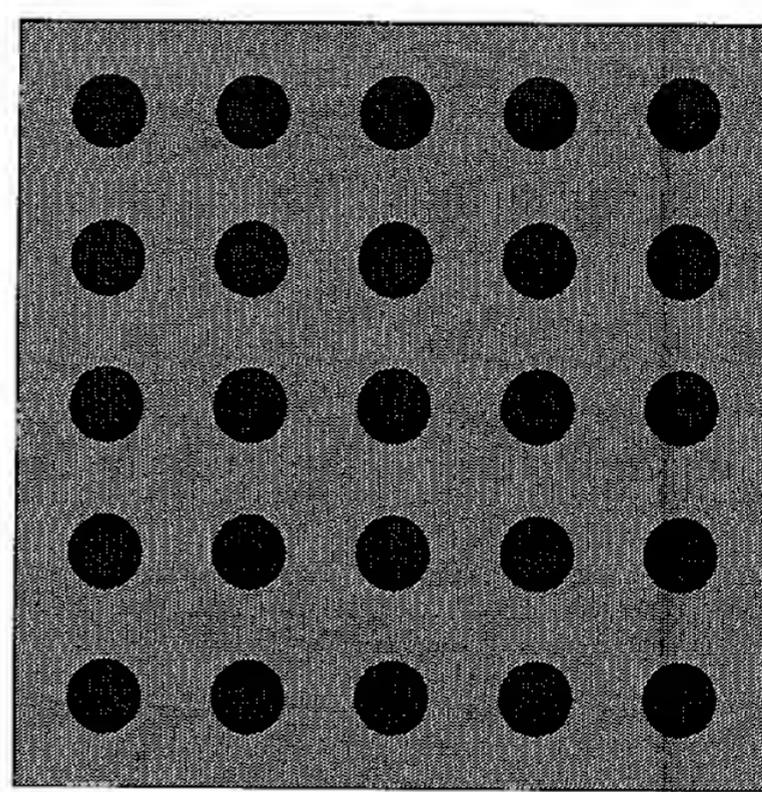


Figure 3B

Figure 3

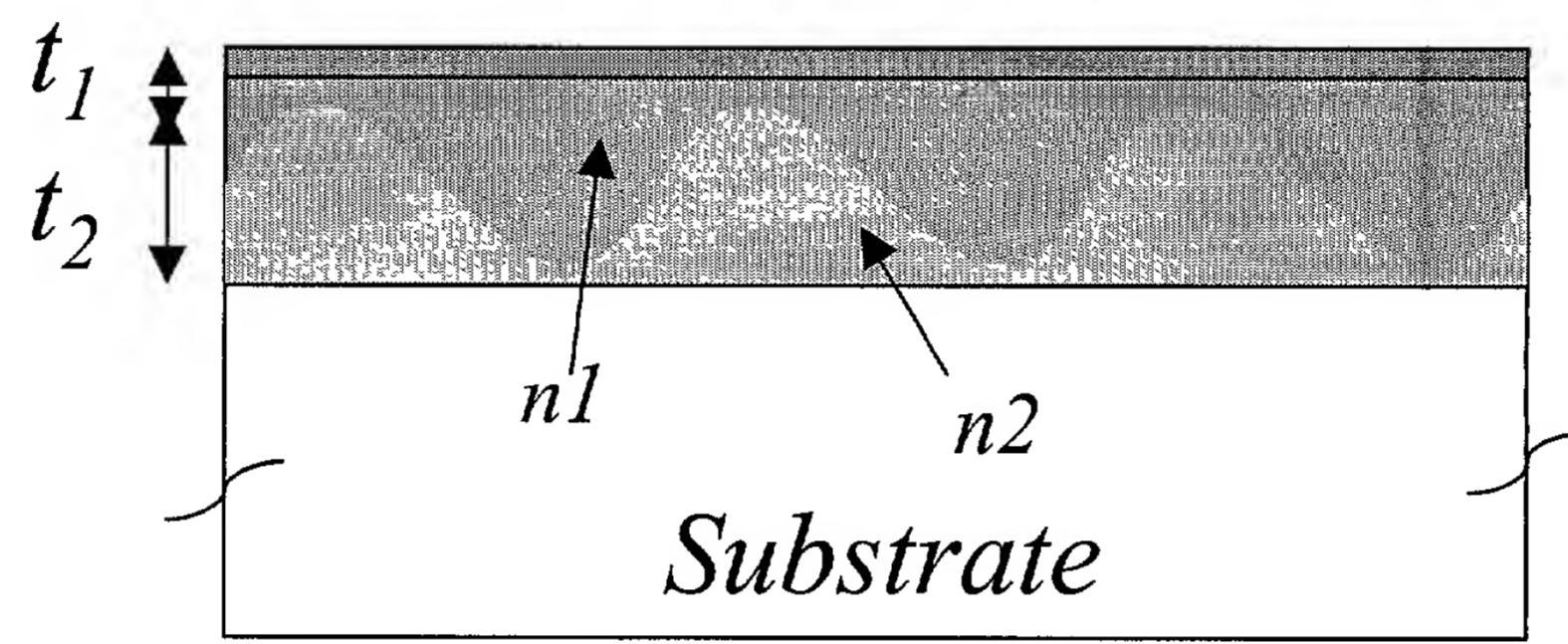


Figure 4.

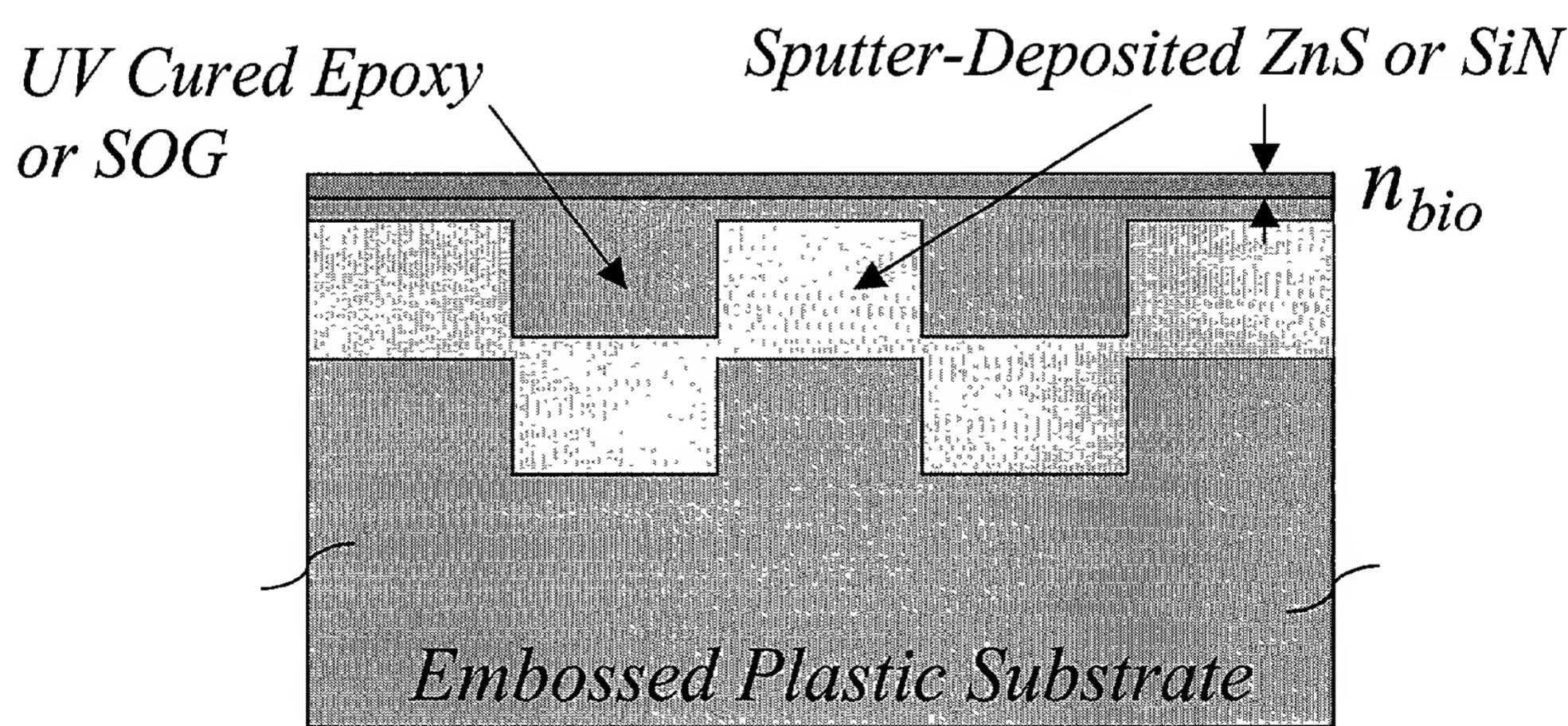


Figure 5.

Amine	<ul style="list-style-type: none"> <li>Sulfo-succinimidyl-6-(biotinamido)hexanoate (Sulfo-NHS-LC-Biotin)           <ul style="list-style-type: none"> <li>• Streptavidin/avidin then biotinylated molecule</li> </ul> </li> </ul>	
	<ul style="list-style-type: none"> <li>N,N'-disuccinimidyl carbonate (DSC)           <ul style="list-style-type: none"> <li>• -NH<sub>2</sub>, non-cleavable</li> </ul> </li> </ul>	
	<ul style="list-style-type: none"> <li>Dimethyl pimelimidate (DMP)           <ul style="list-style-type: none"> <li>• -NH<sub>2</sub>, non-cleavable</li> </ul> </li> </ul>	
	<ul style="list-style-type: none"> <li>Dimethyl 3,3'-dithiobispropionimidate (DTBP)           <ul style="list-style-type: none"> <li>• -NH<sub>2</sub>, cleavable</li> </ul> </li> </ul>	
	<ul style="list-style-type: none"> <li>1-Ethyl-3-(3-Dimethylaminopropyl)carbodiimide Hydrochloride (EDC) &amp; N-Hydroxysulfosuccinimide (Sulfo-NHS)           <ul style="list-style-type: none"> <li>• -COOH</li> </ul> </li> </ul>	
	<ul style="list-style-type: none"> <li>Sulfo-succinimidyl 6-[a-methyl-a-(2-pyridyl-dithio)toluamido]hexanoate (Sulfo-LC-SMPT)           <ul style="list-style-type: none"> <li>• -SH, cleavable</li> </ul> </li> </ul>	
	<ul style="list-style-type: none"> <li>Sulfo-succinimidyl 4-(N-maleimidomethyl)cyclohexane-1-carboxylate (Sulfo-SMCC)           <ul style="list-style-type: none"> <li>• -SH, non-cleavable</li> </ul> </li> </ul>	
	<ul style="list-style-type: none"> <li>N-(β-Maleimidopropoxy) succinimide ester (BMPS)           <ul style="list-style-type: none"> <li>• -SH, non-cleavable</li> </ul> </li> </ul>	
Aldehyde	<ul style="list-style-type: none"> <li>Directly with aldehyde or first amino then aldehyde           <ul style="list-style-type: none"> <li>• -NH<sub>2</sub></li> </ul> </li> </ul>	
Ni(II)	<ul style="list-style-type: none"> <li>Using nitrilotriacetic acid (NTA) group, which forms a chelate with Ni(II)           <ul style="list-style-type: none"> <li>• His-tagged molecules</li> </ul> </li> </ul>	

Figure 6

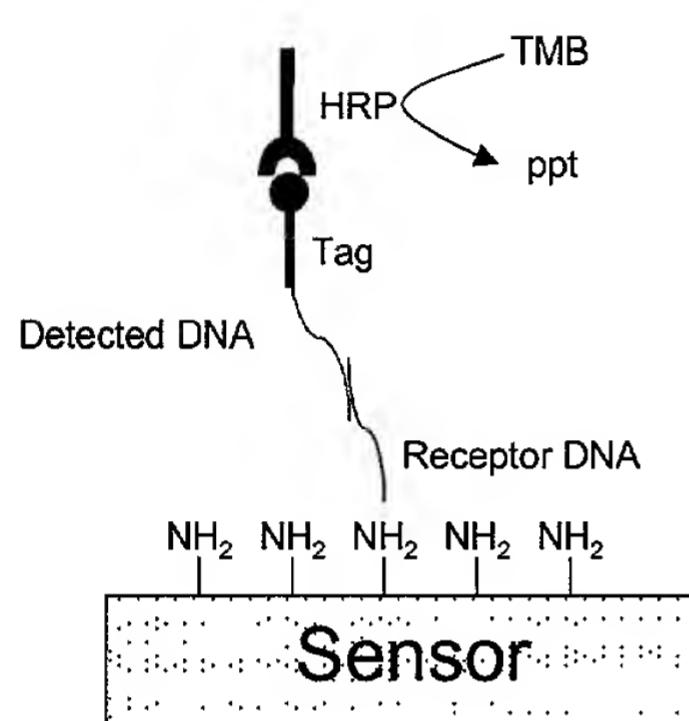


Figure 7A

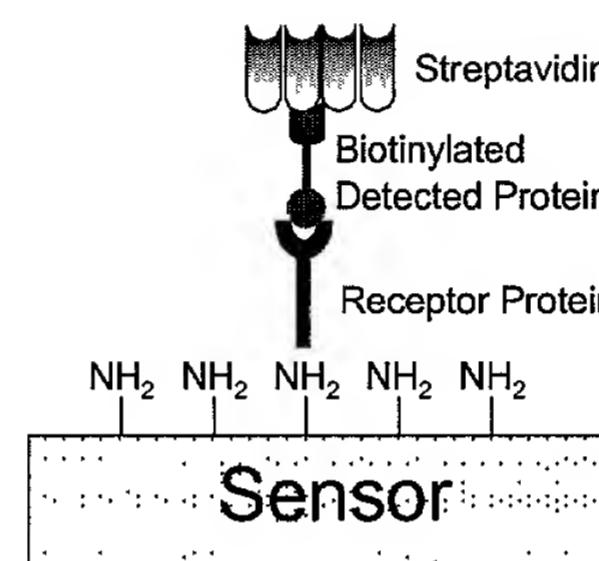


Figure 7B

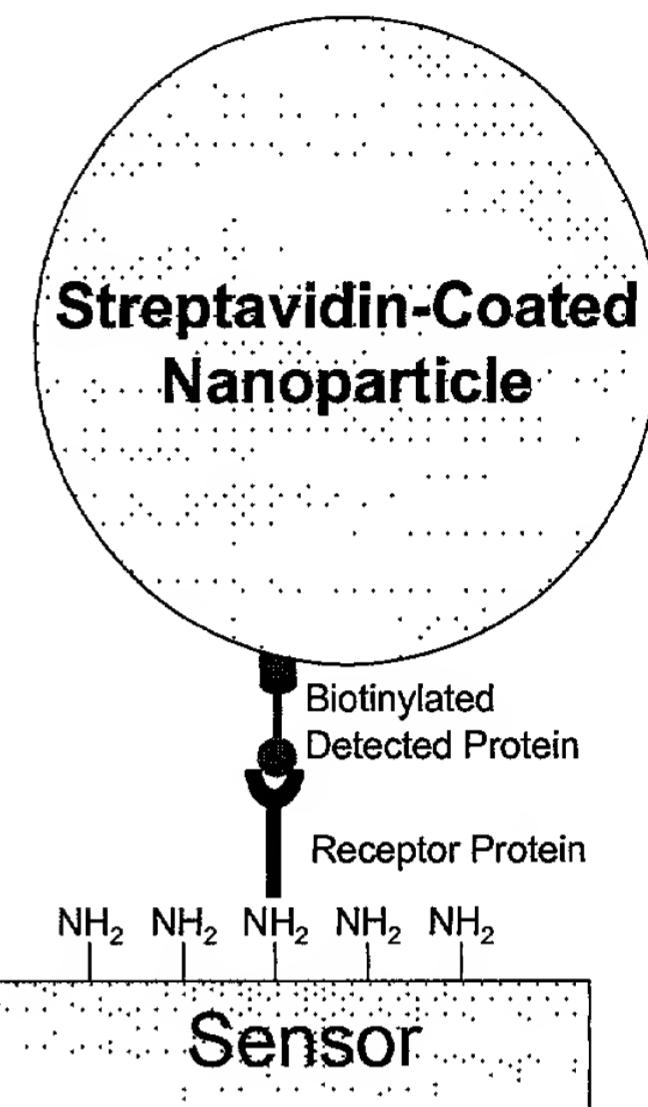


Figure 7C

Figure 7

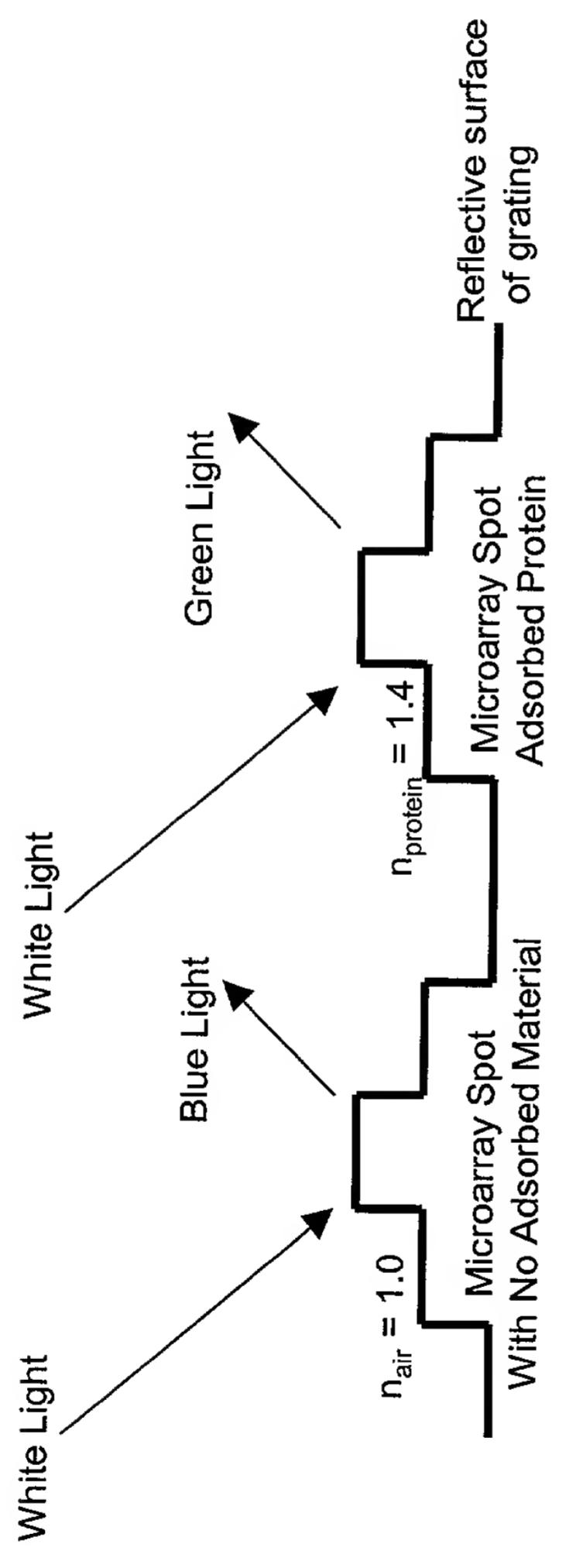
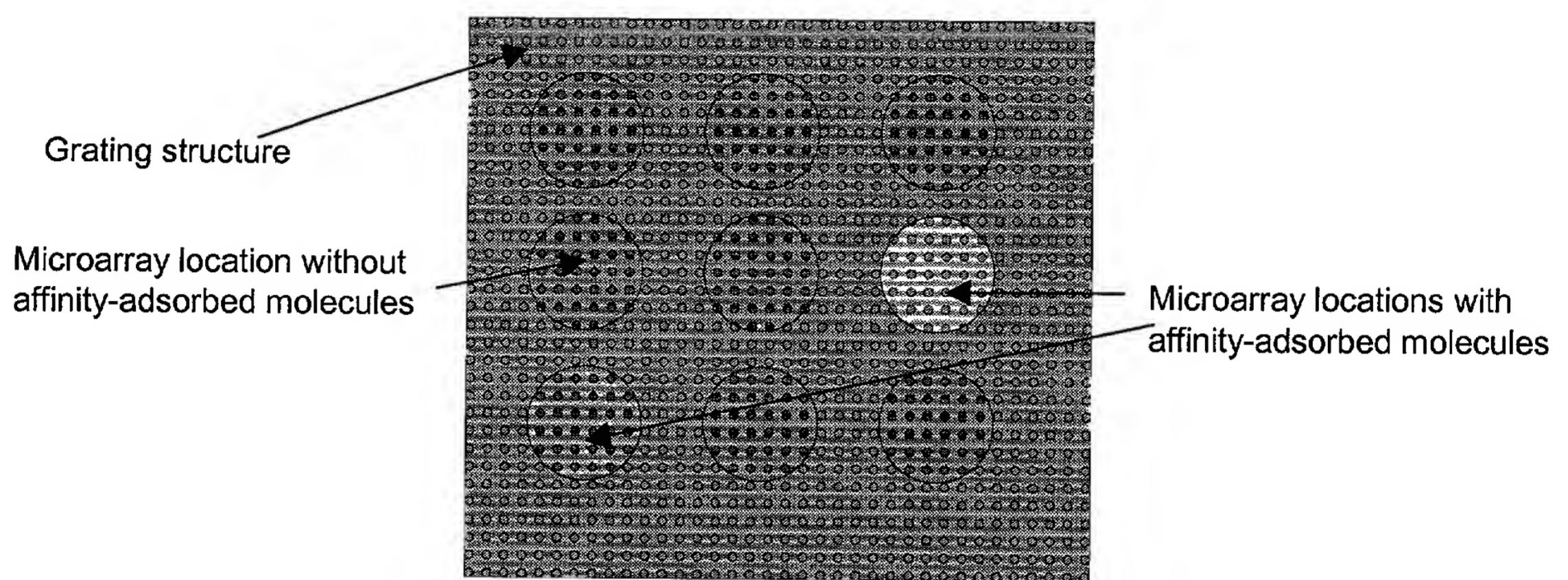


FIGURE 8



**FIGURE 9**

Microtiter plate

Microarray slide

**Plastic bottomless microtiter plate.**  
**Holes in plate are open from top to bottom**

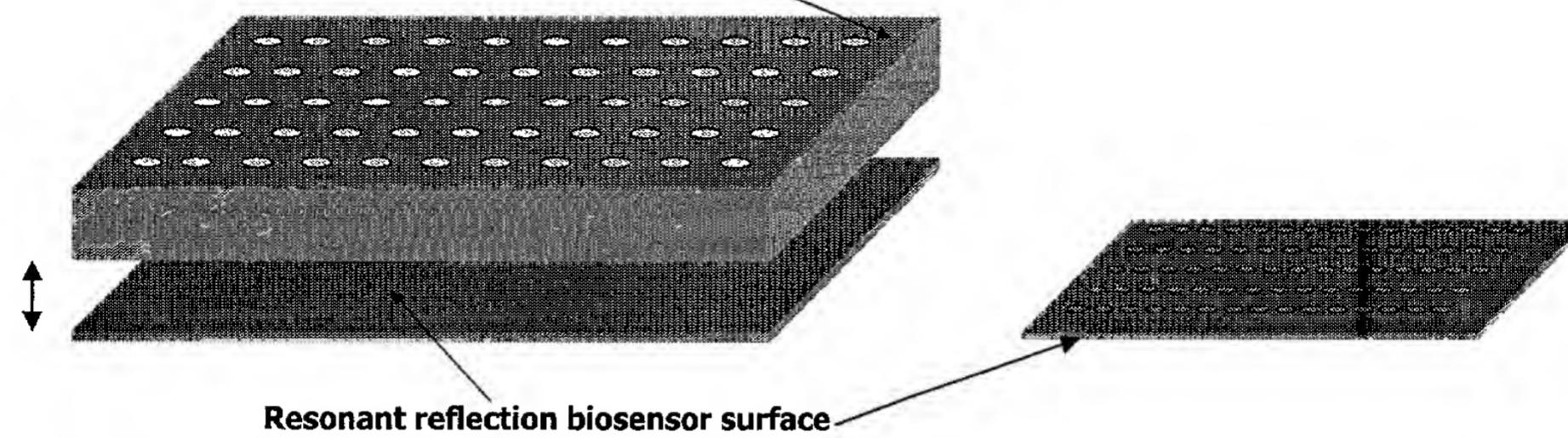


Figure 10A

Figure 10B

Figure 10

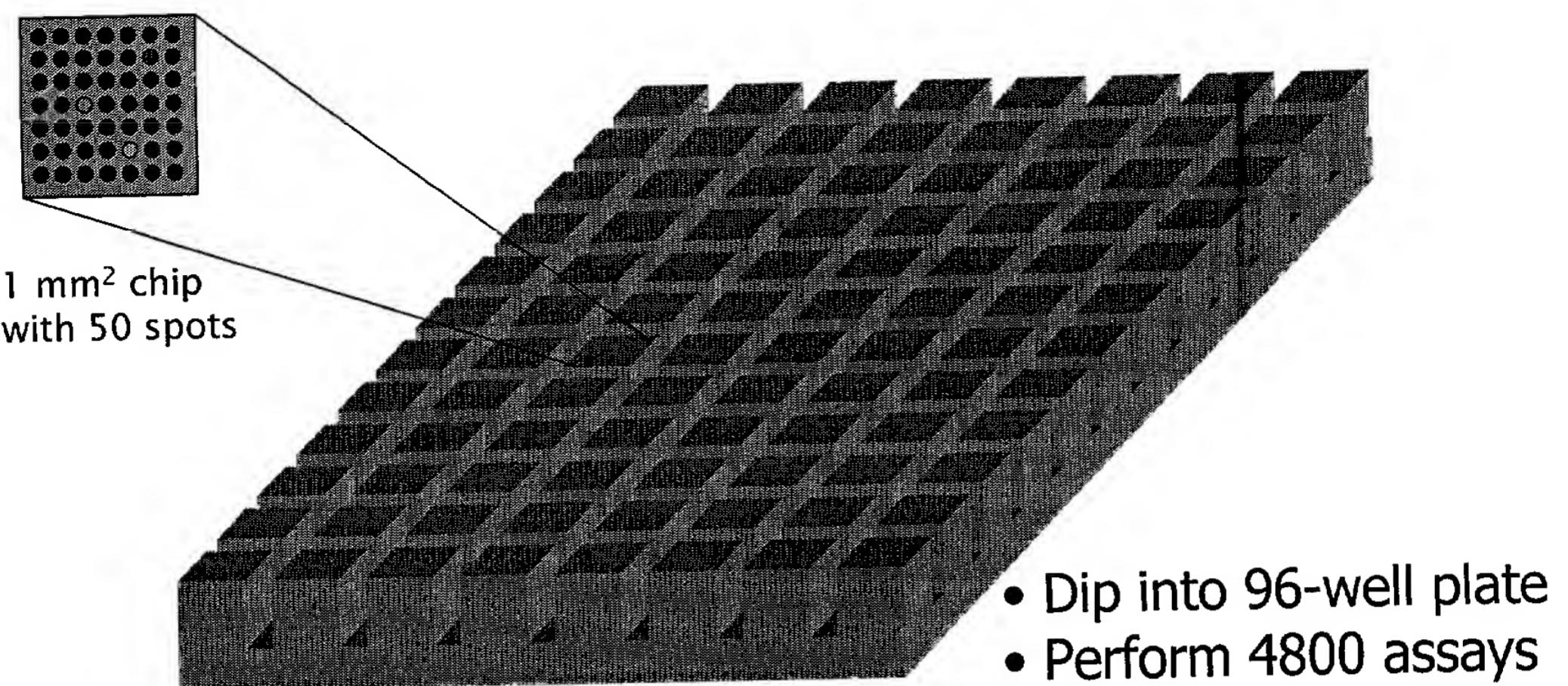
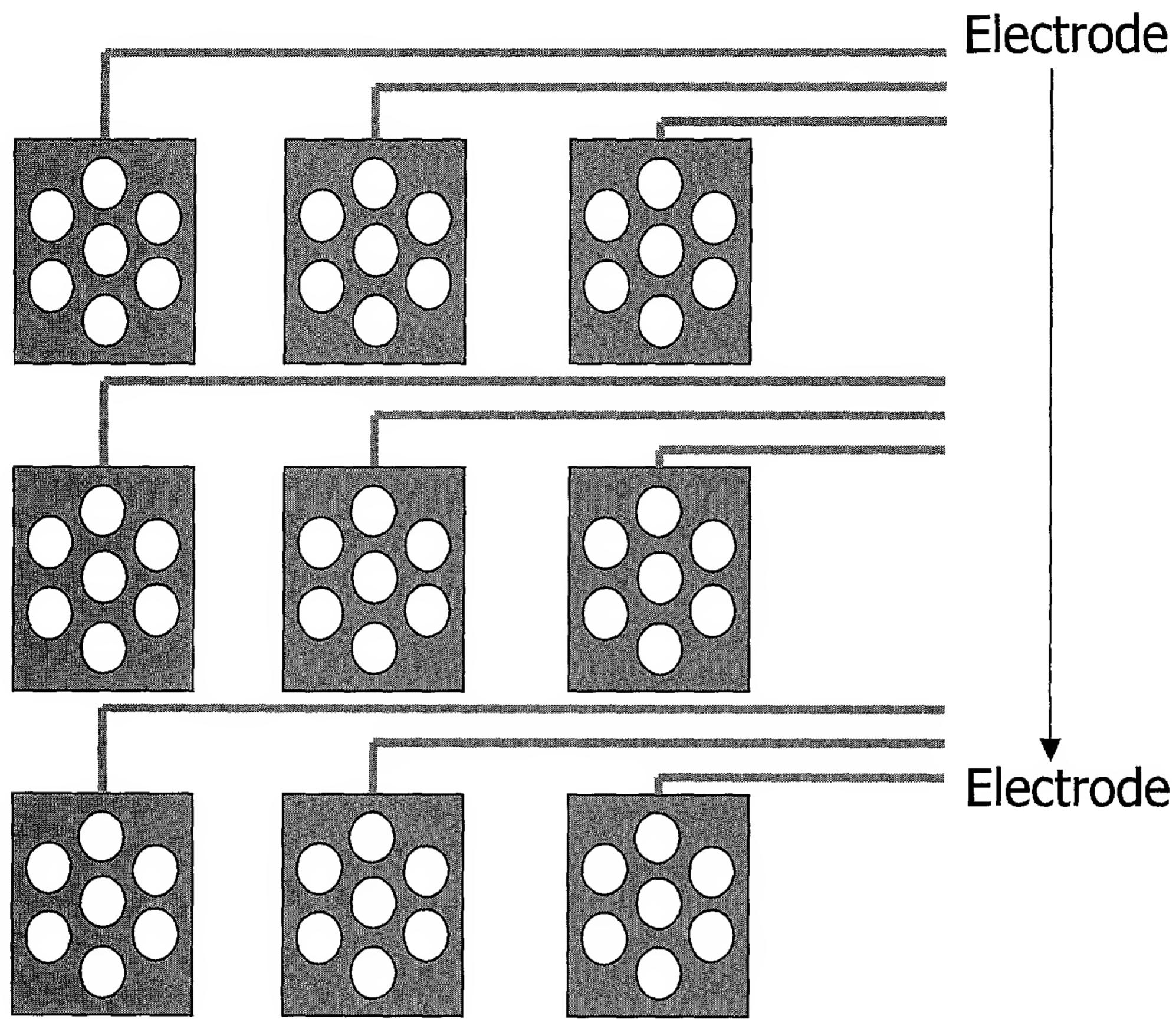
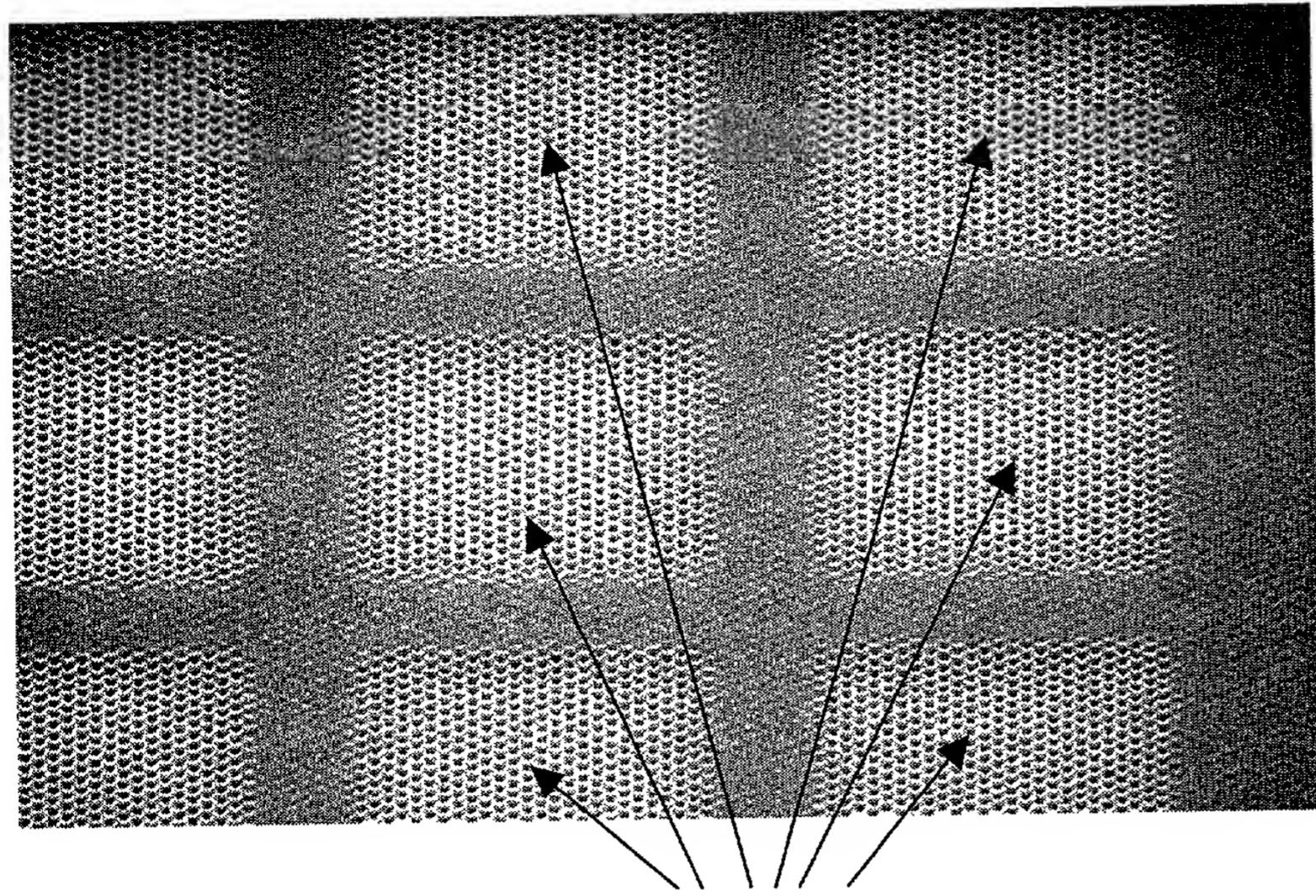


Figure 11

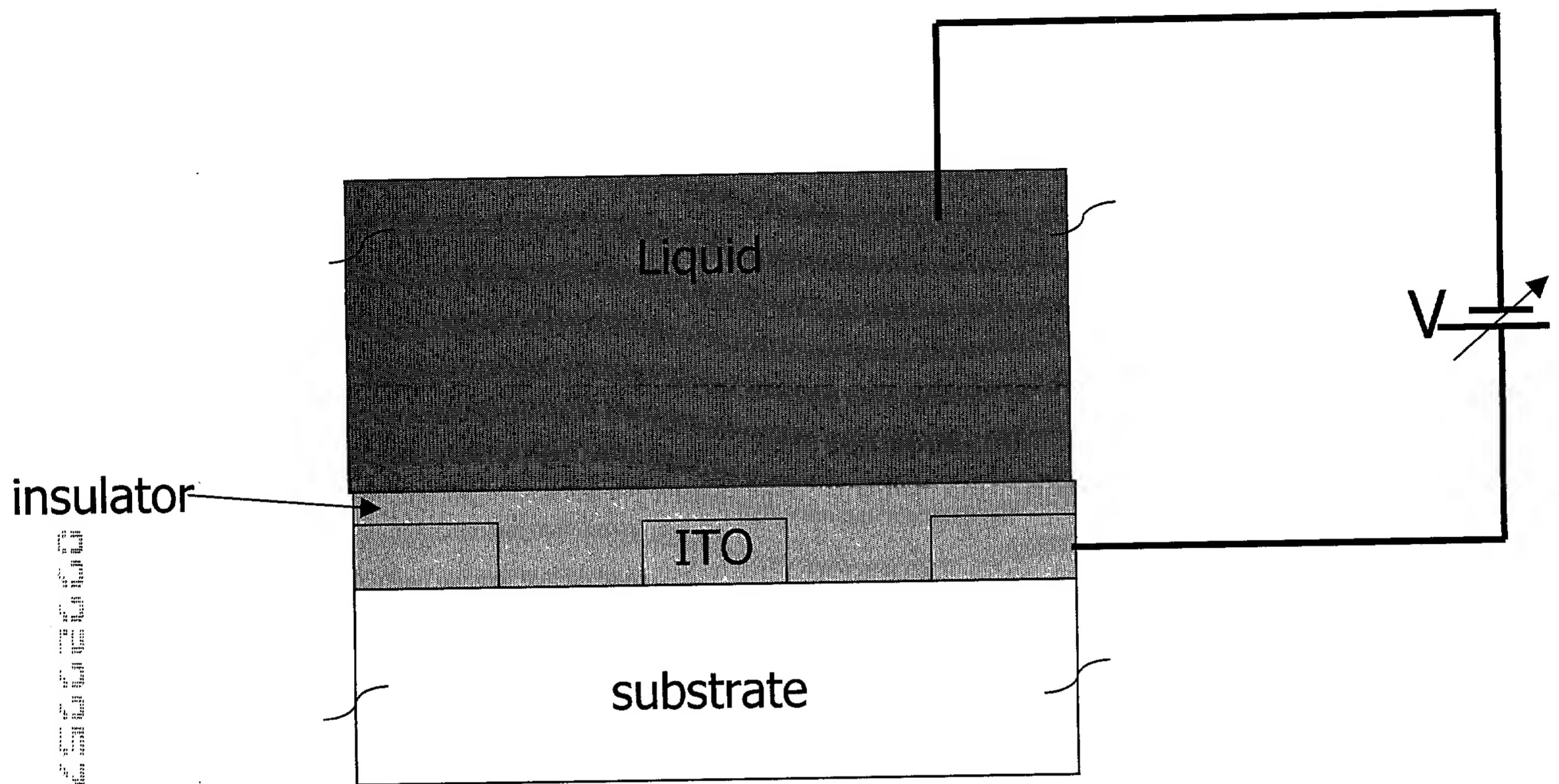


**FIGURE 12**

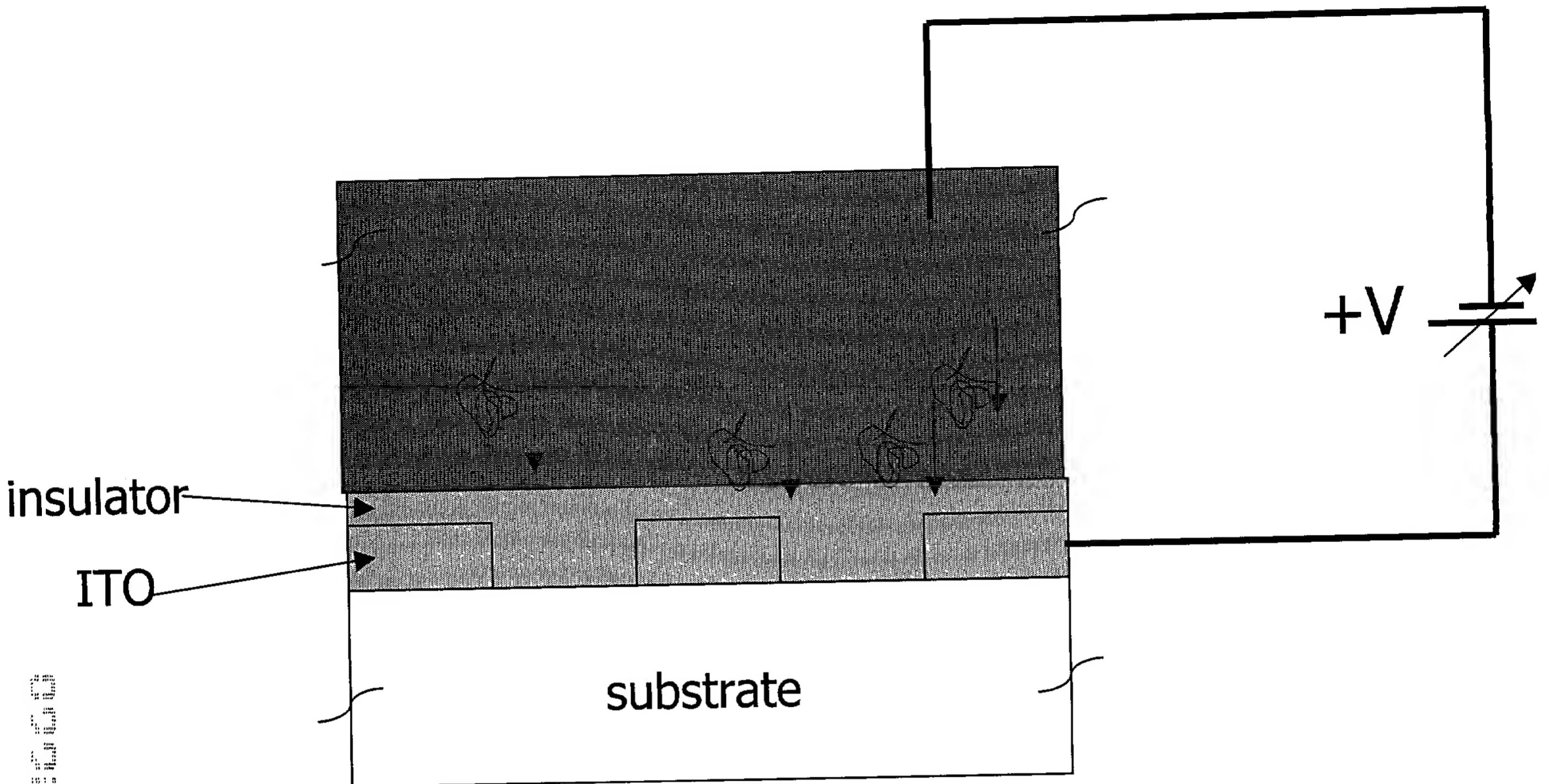


Separate electrode grating regions

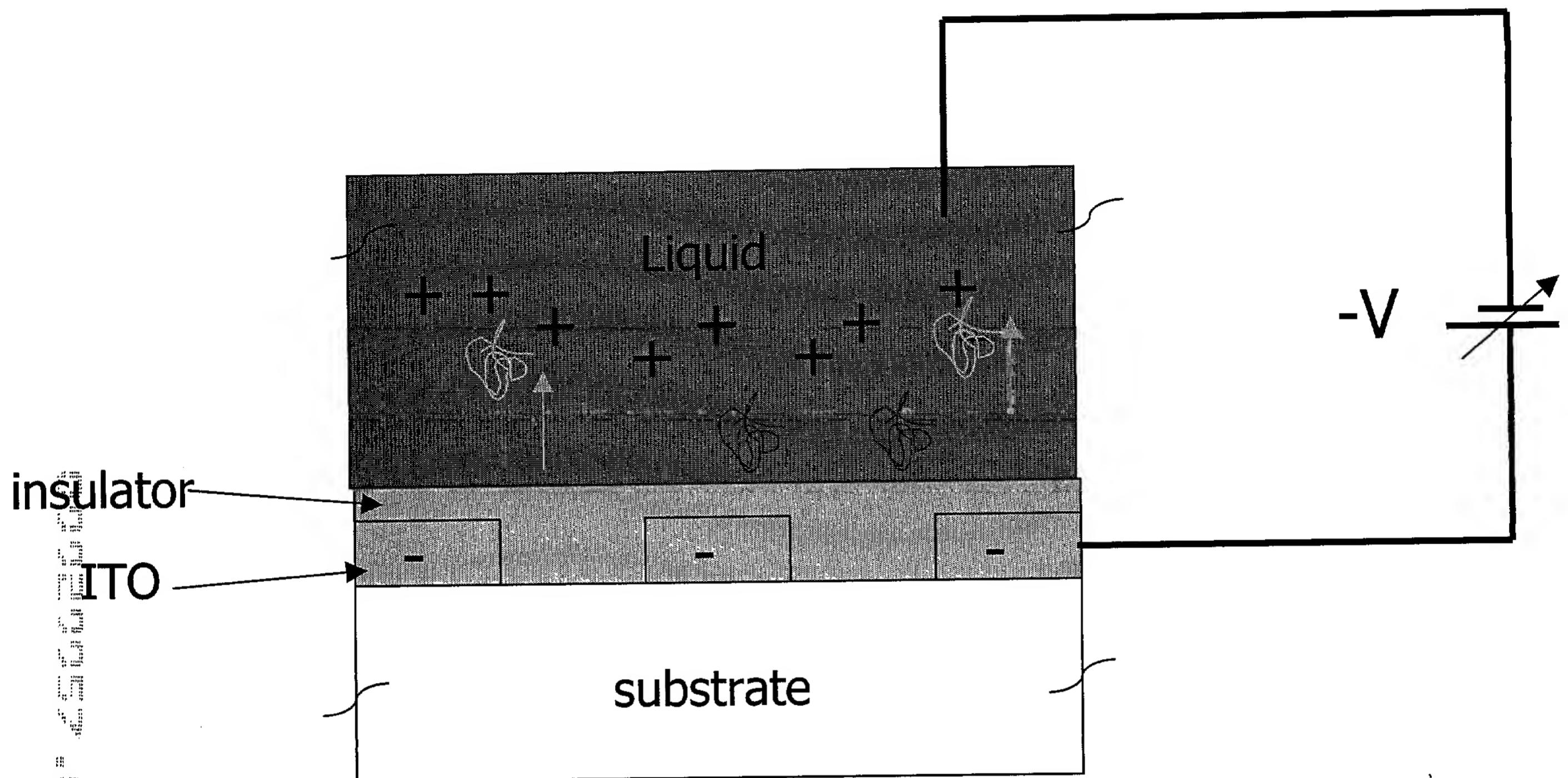
**FIGURE 13**



**FIGURE 14**



**FIGURE 15**



**FIGURE 16**

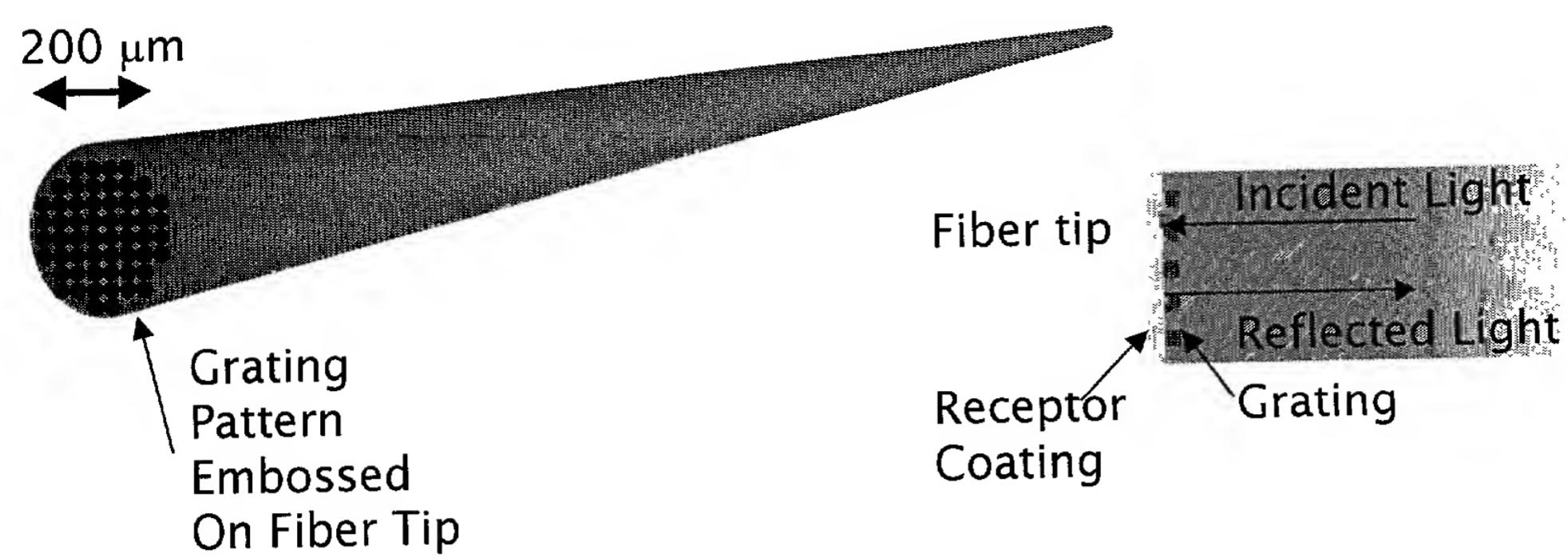


Figure 17

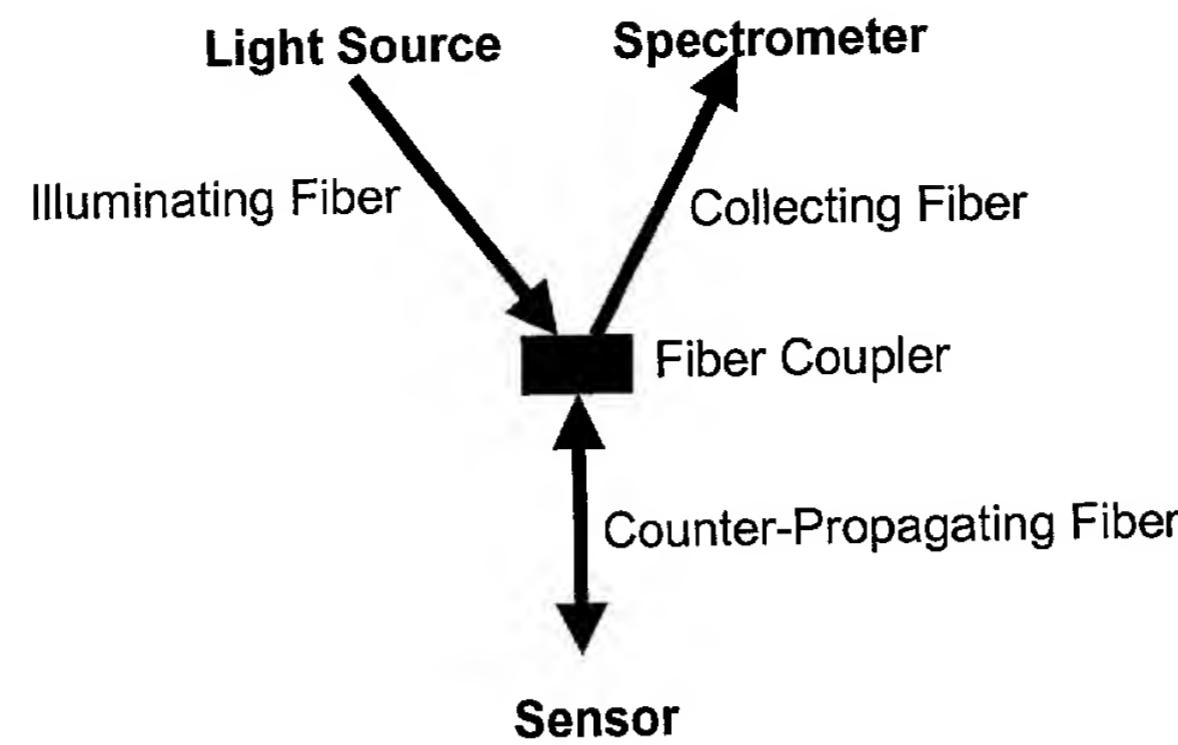


Figure 18

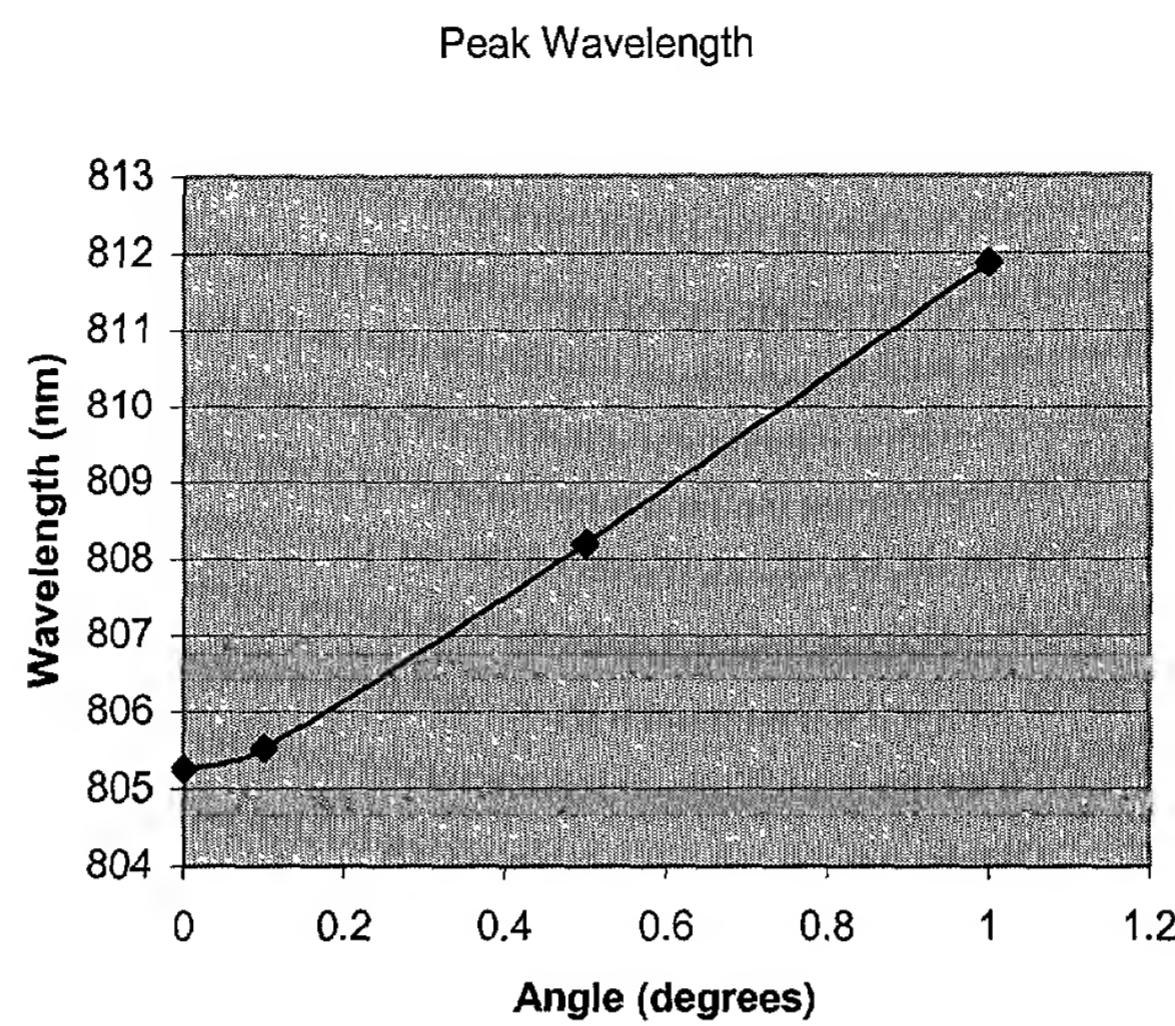


Figure 19

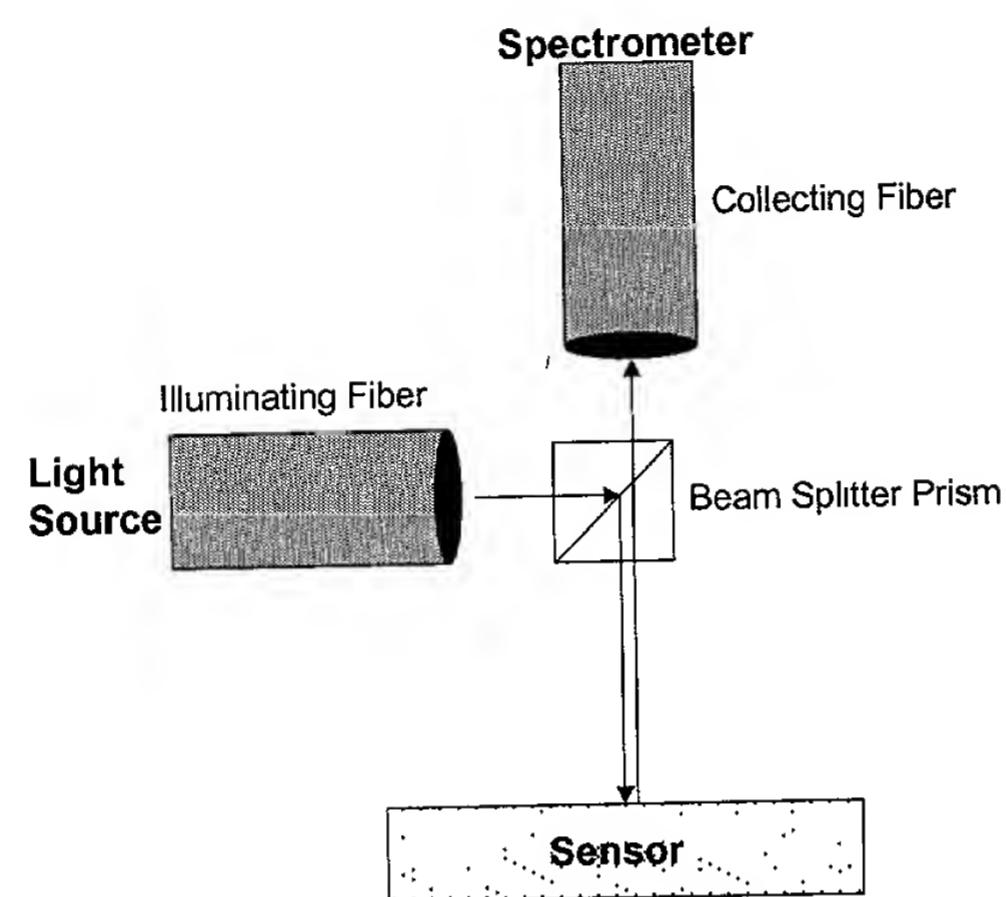


Figure 20

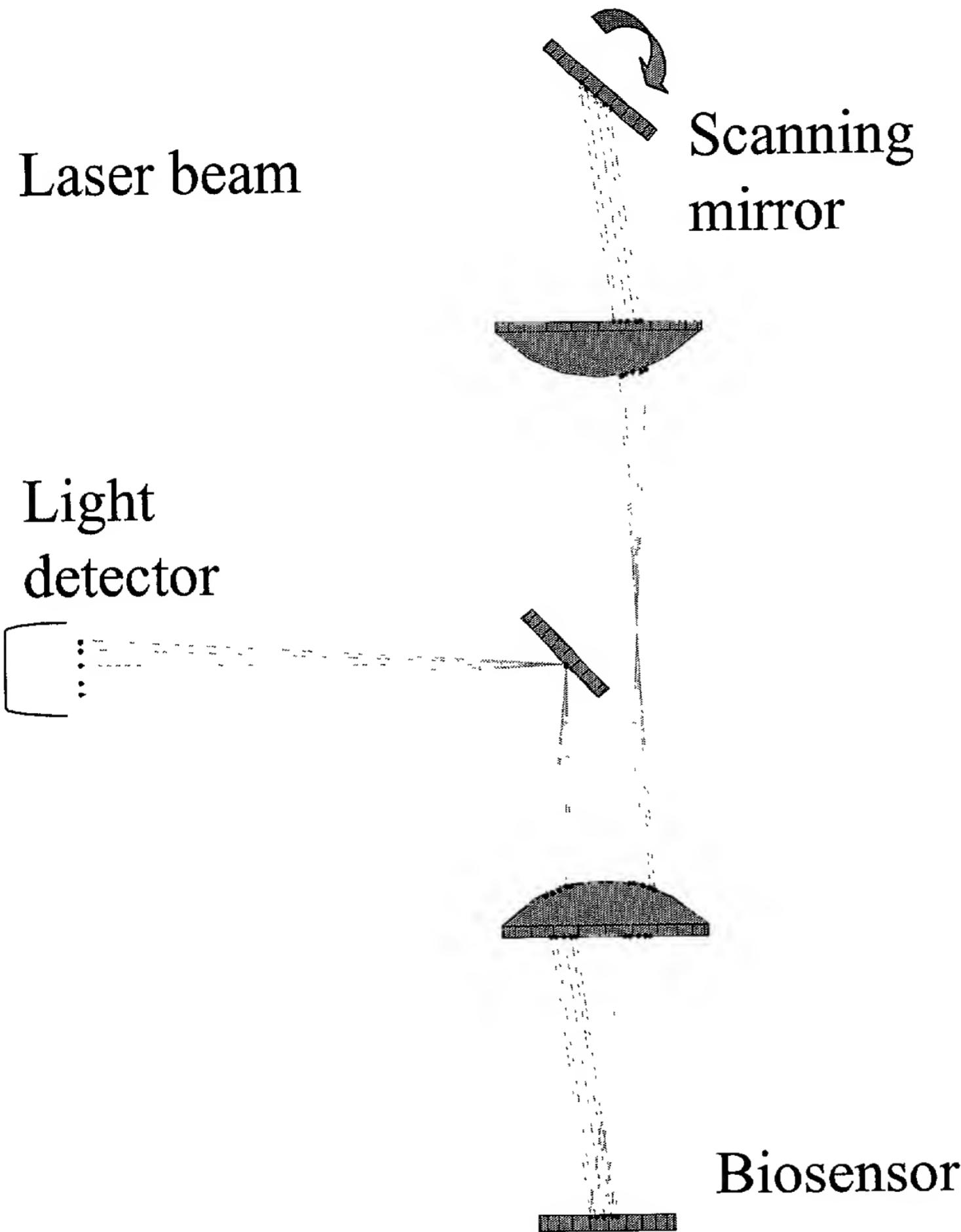


Figure 21

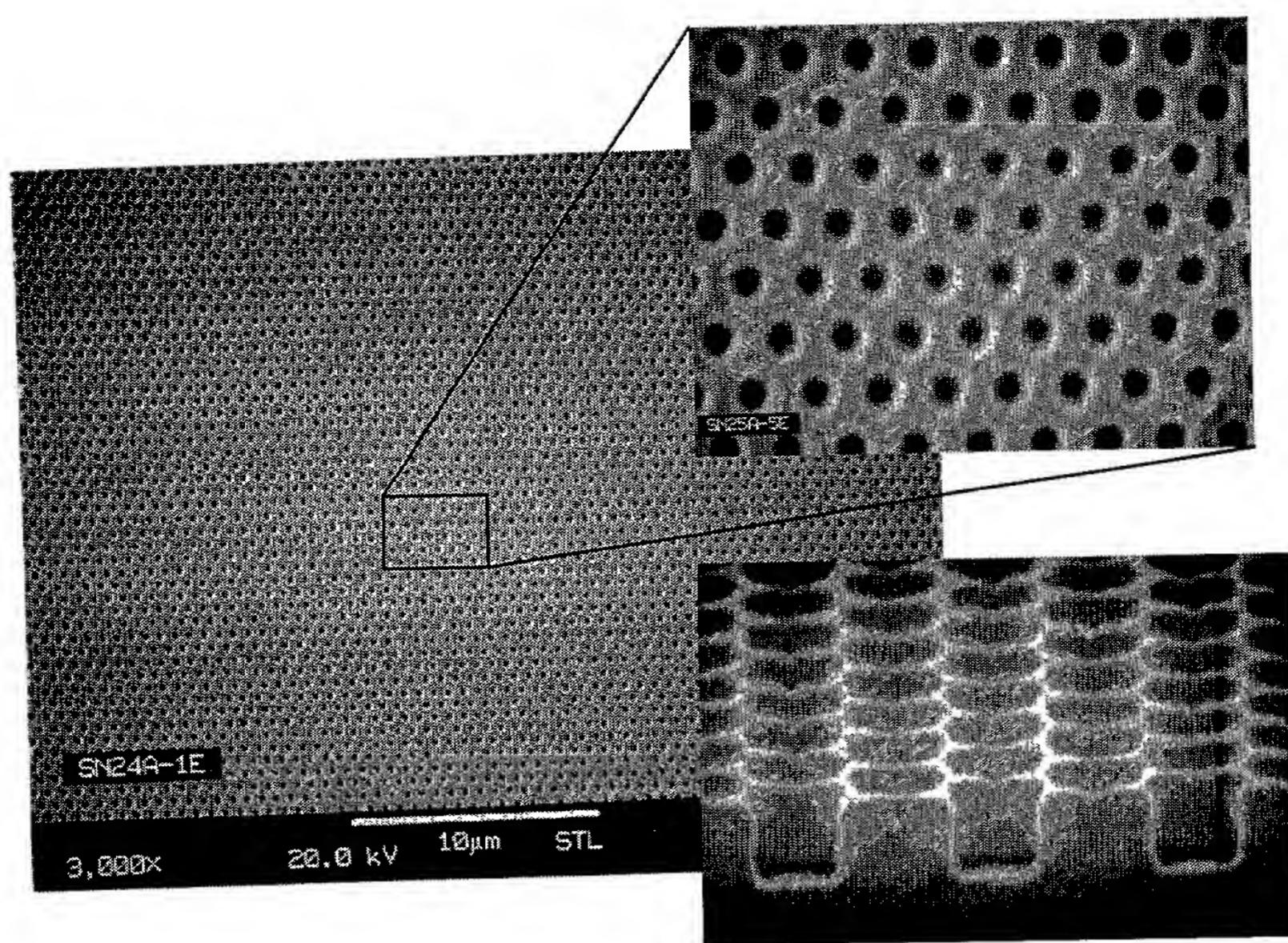


Figure 22

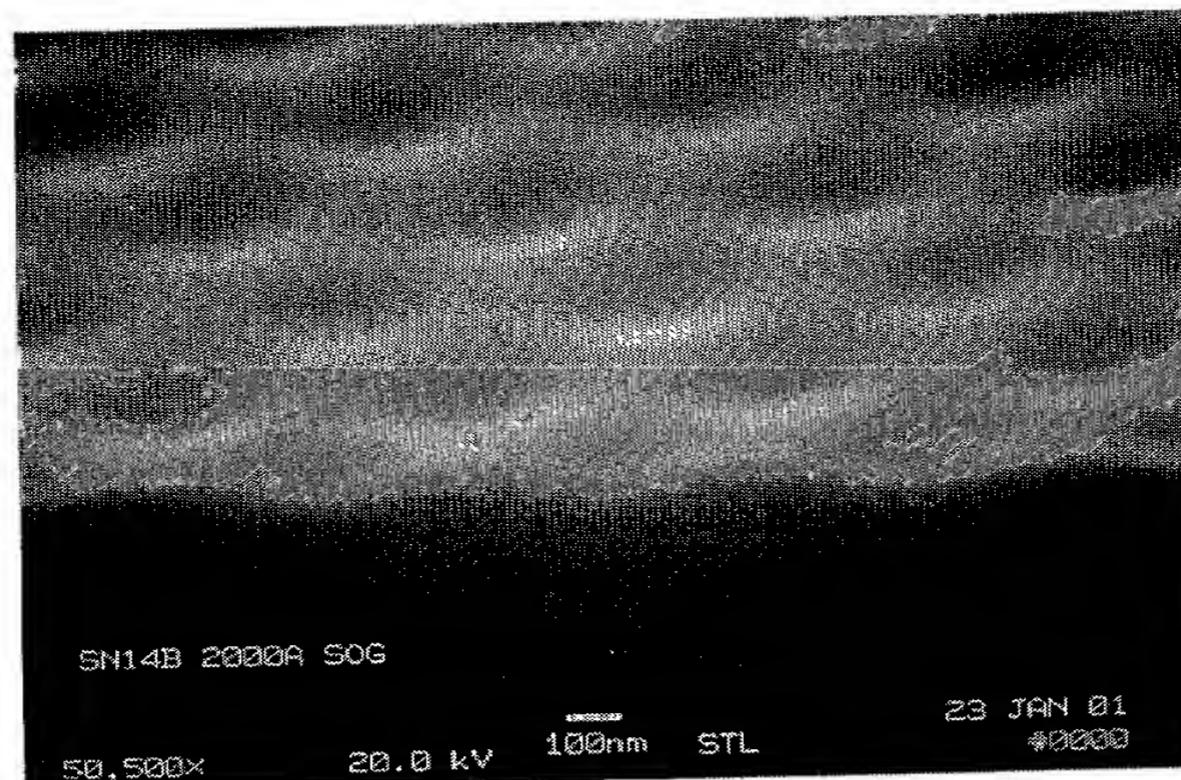


Figure 23

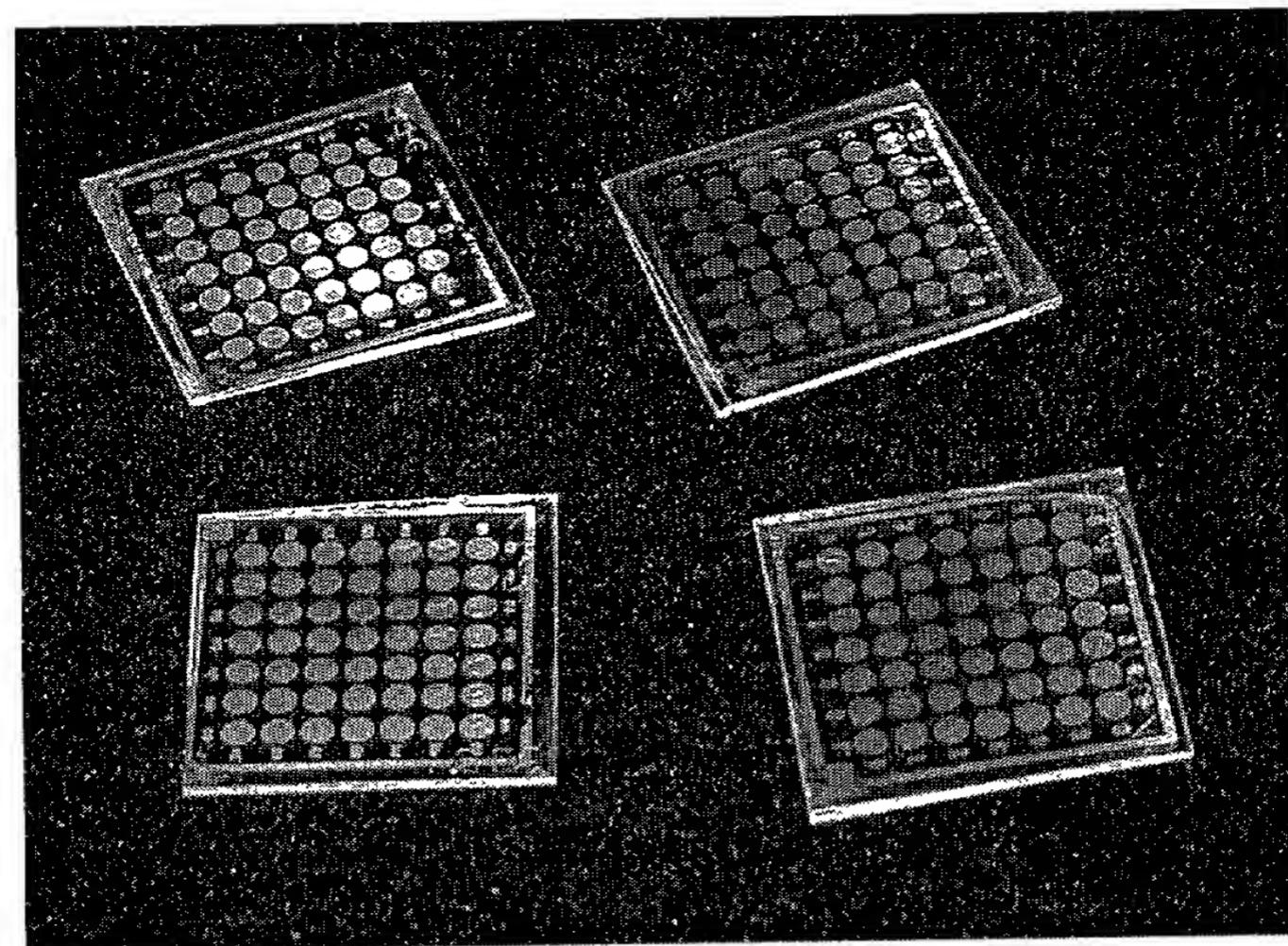


Figure 24

### Albumin Deposition on Resonant Reflector

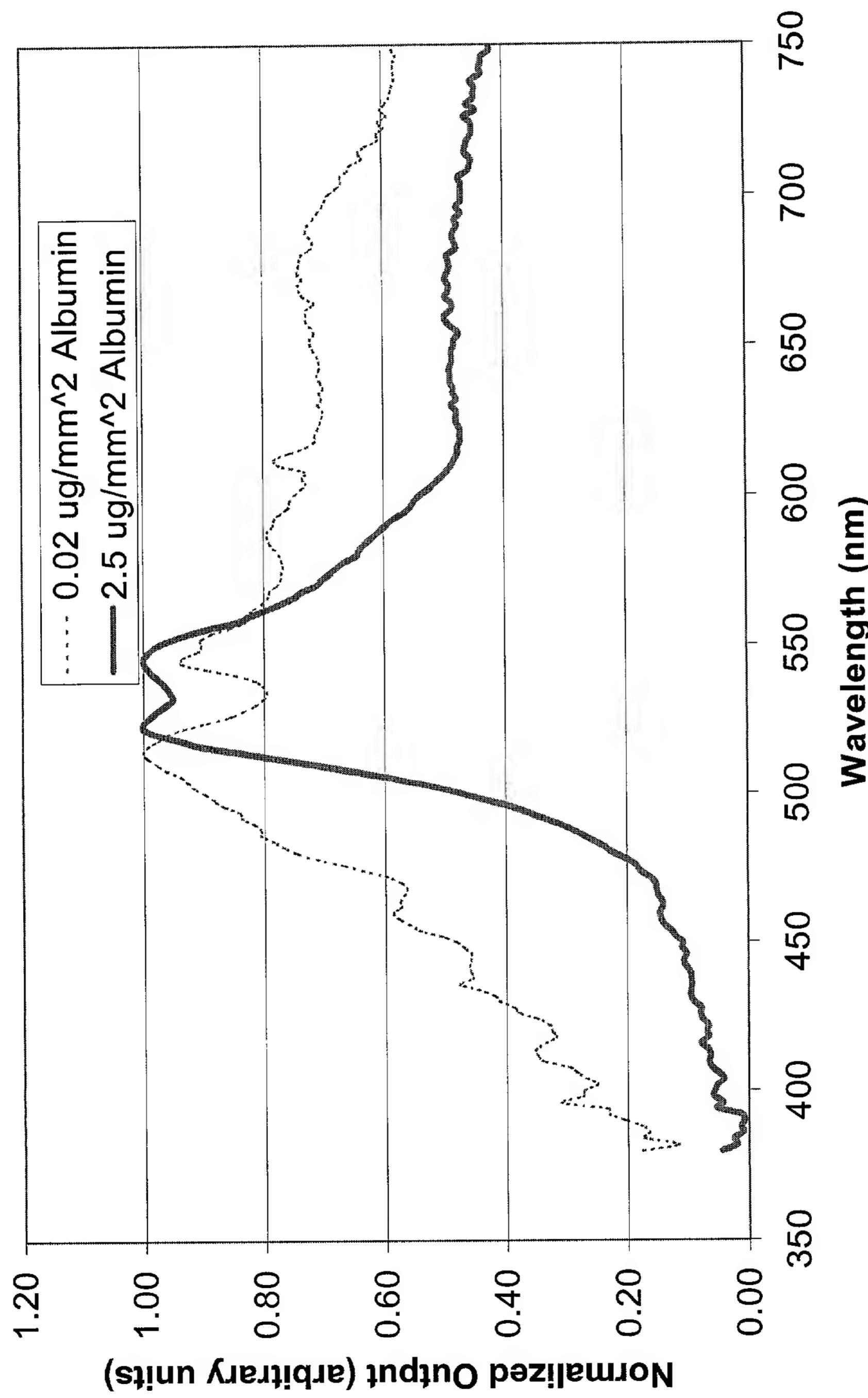


Figure 25

Figure 26

Resonant Reflector Measured in Water

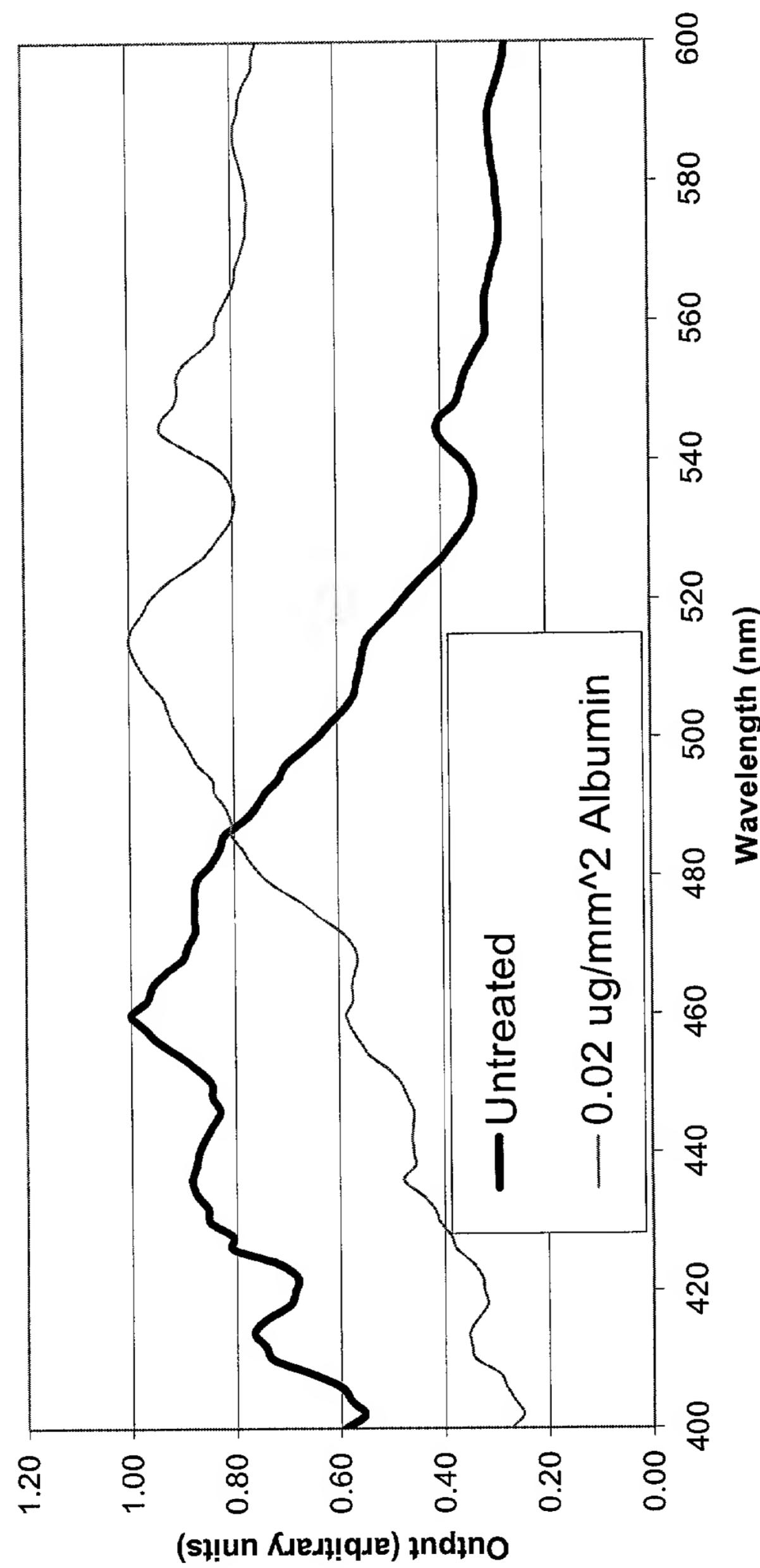


Figure 27  
Bacteria immobilization on structure

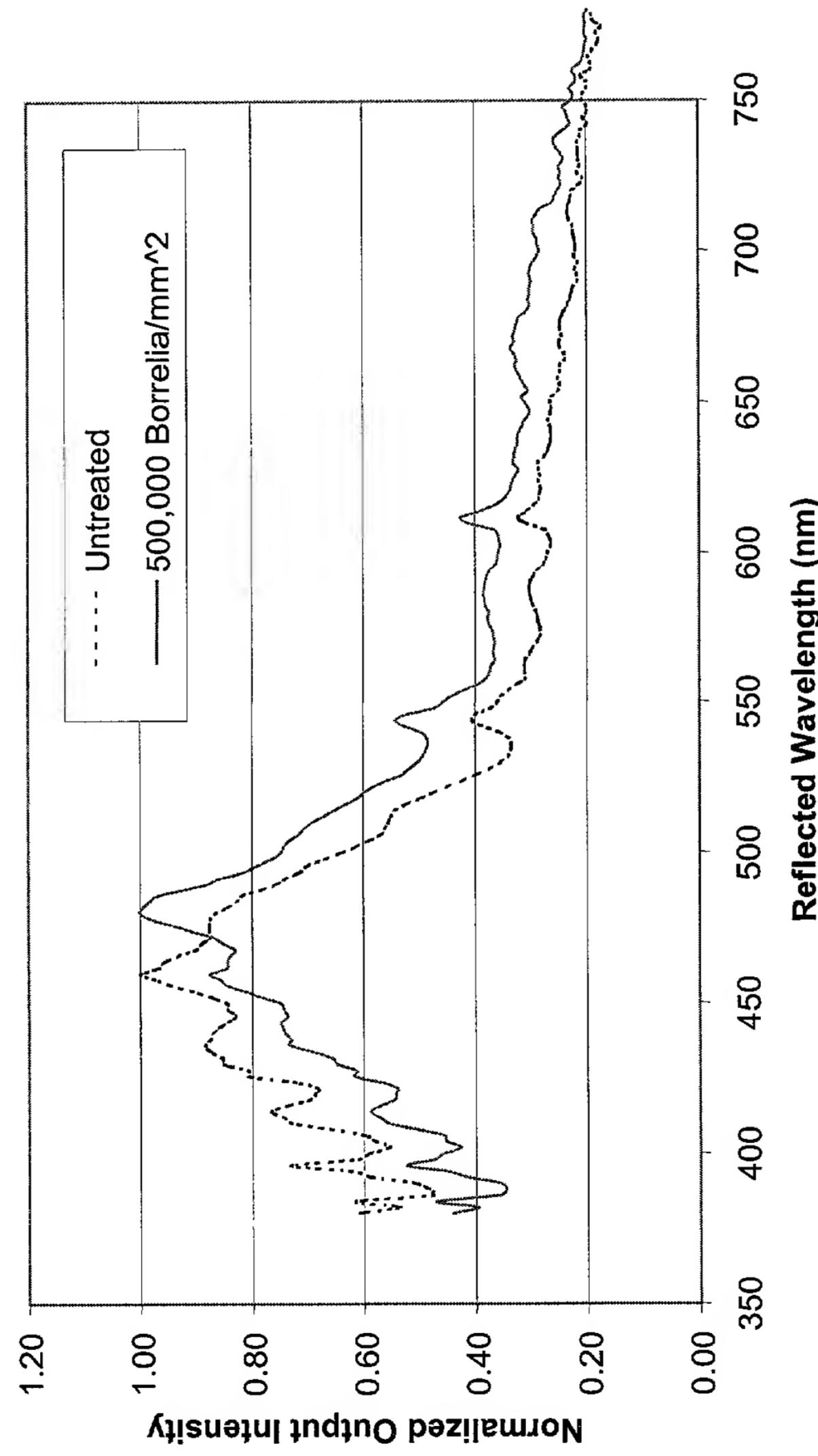


Figure 28

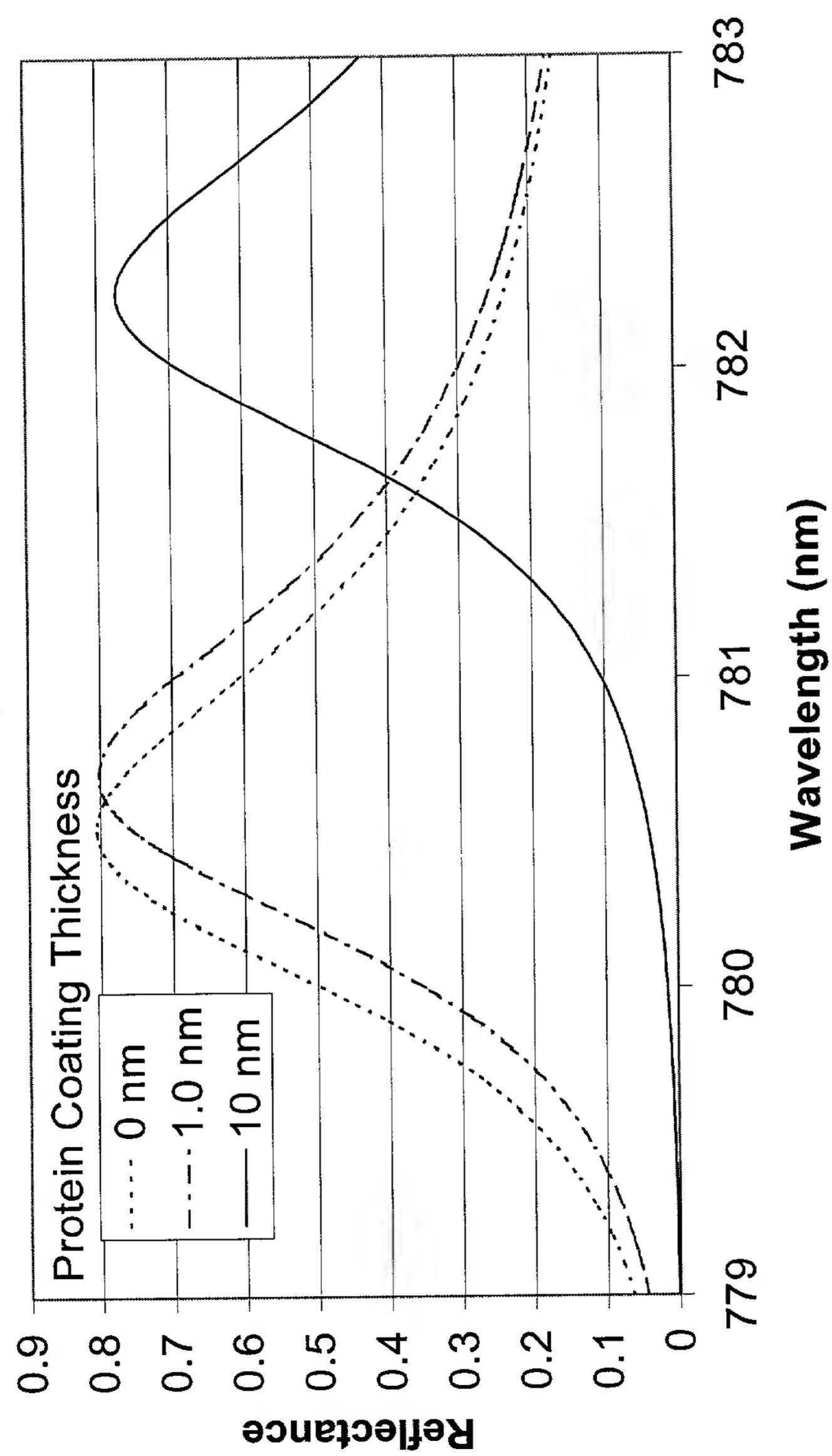
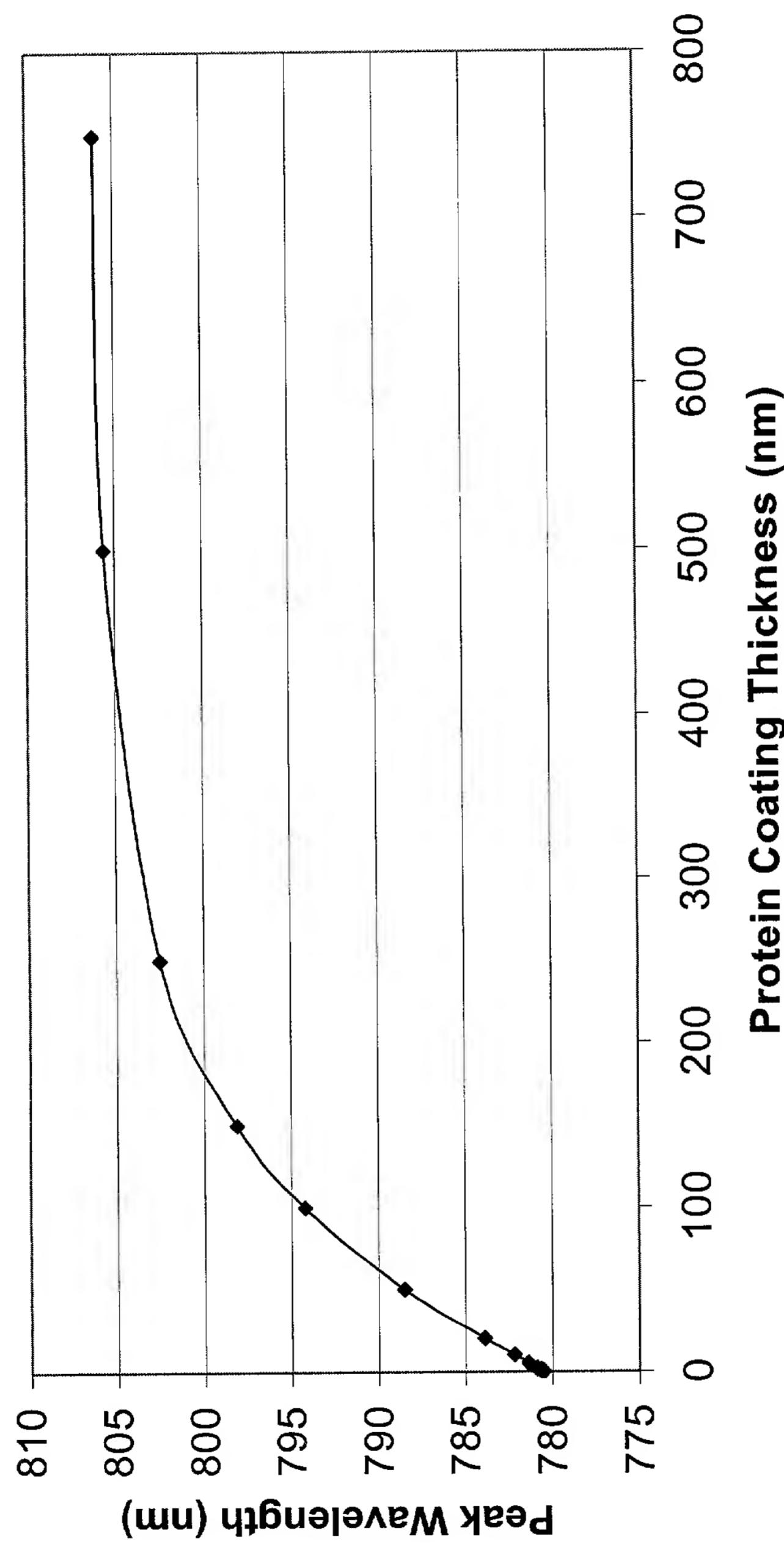


Figure 29



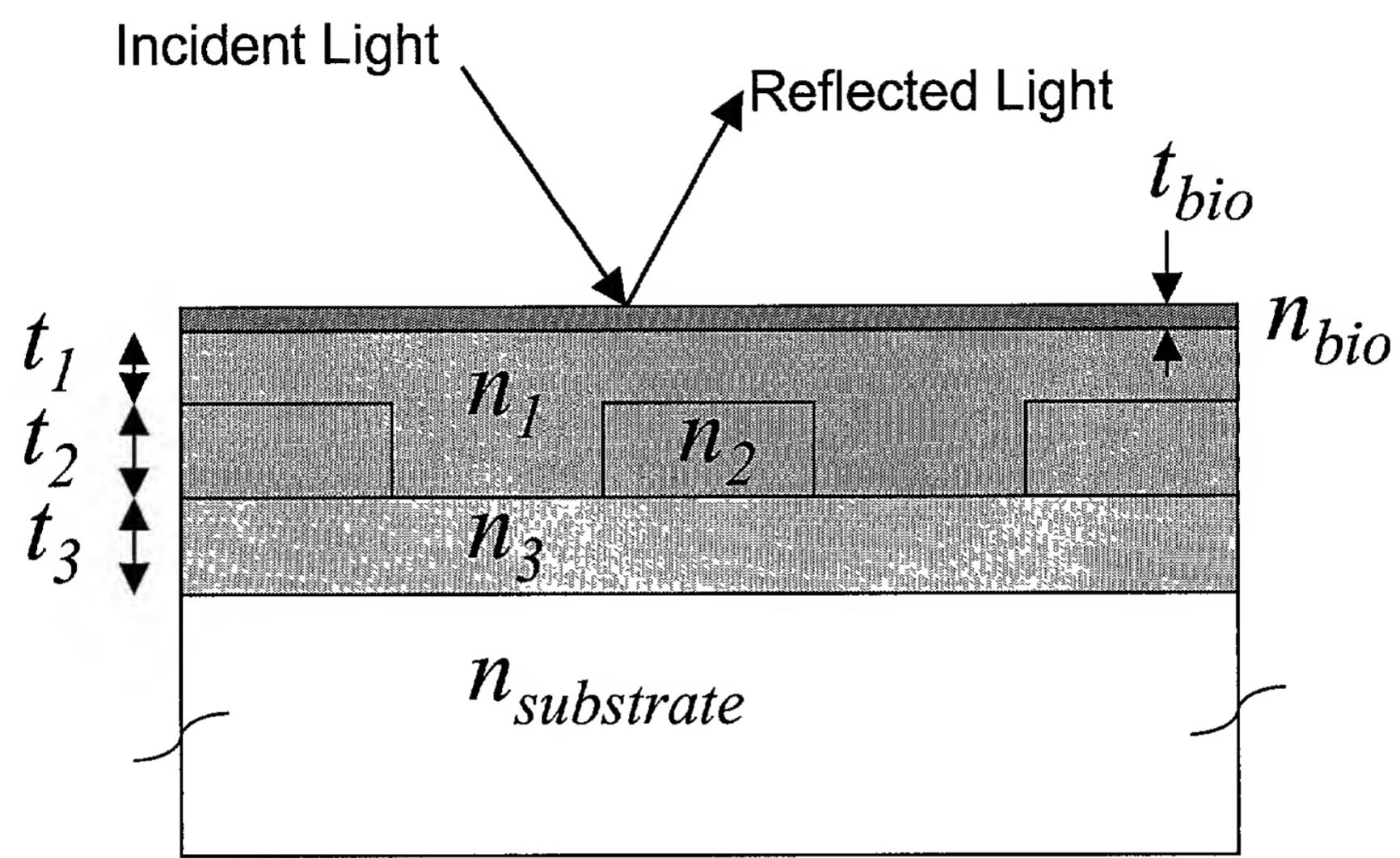


FIGURE 30

### Reflected Resonance with Deposited Protein

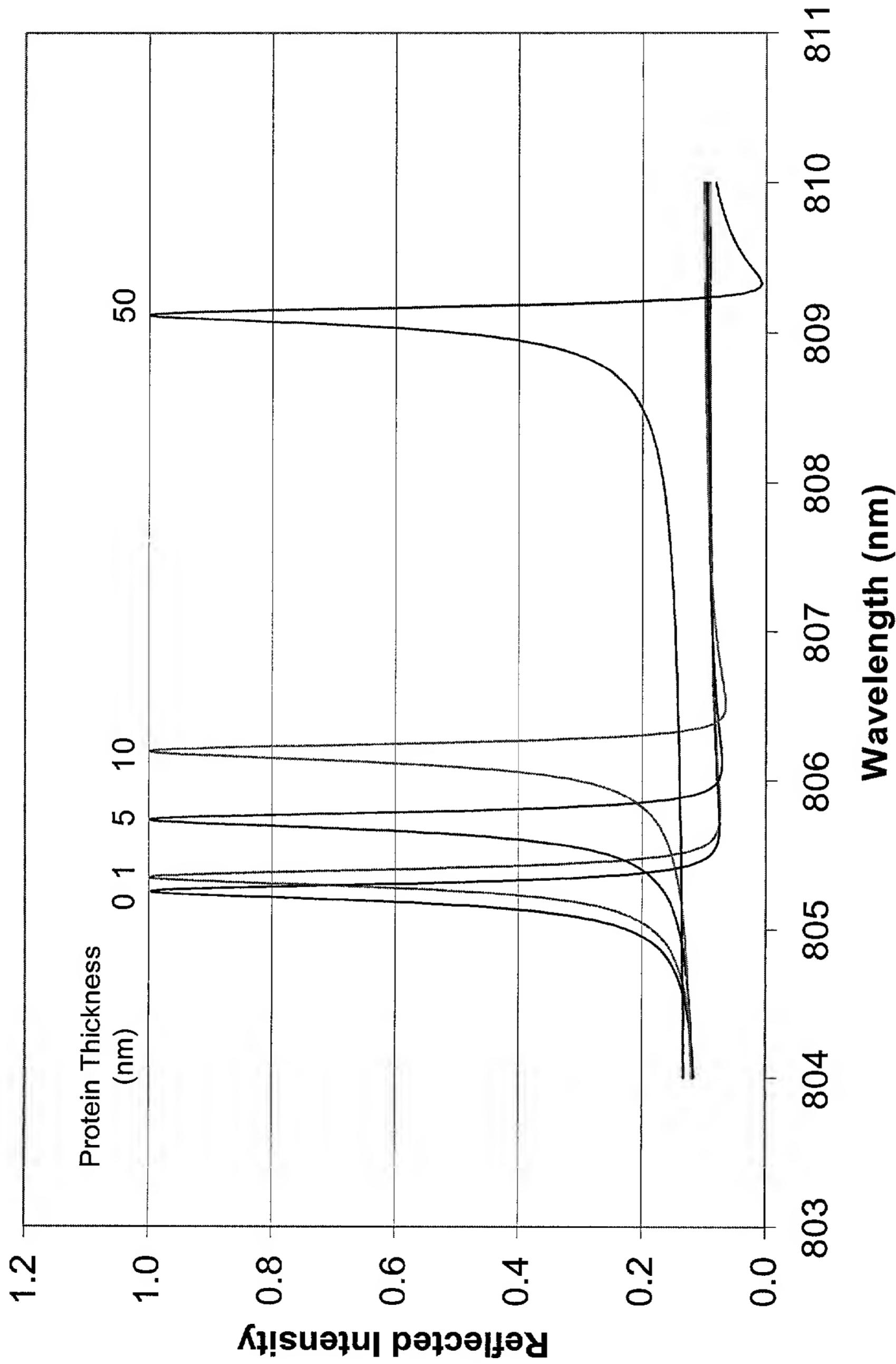


Figure 31

**Resonant Peak Wavelength Dependence on Deposited Protein Thickness**

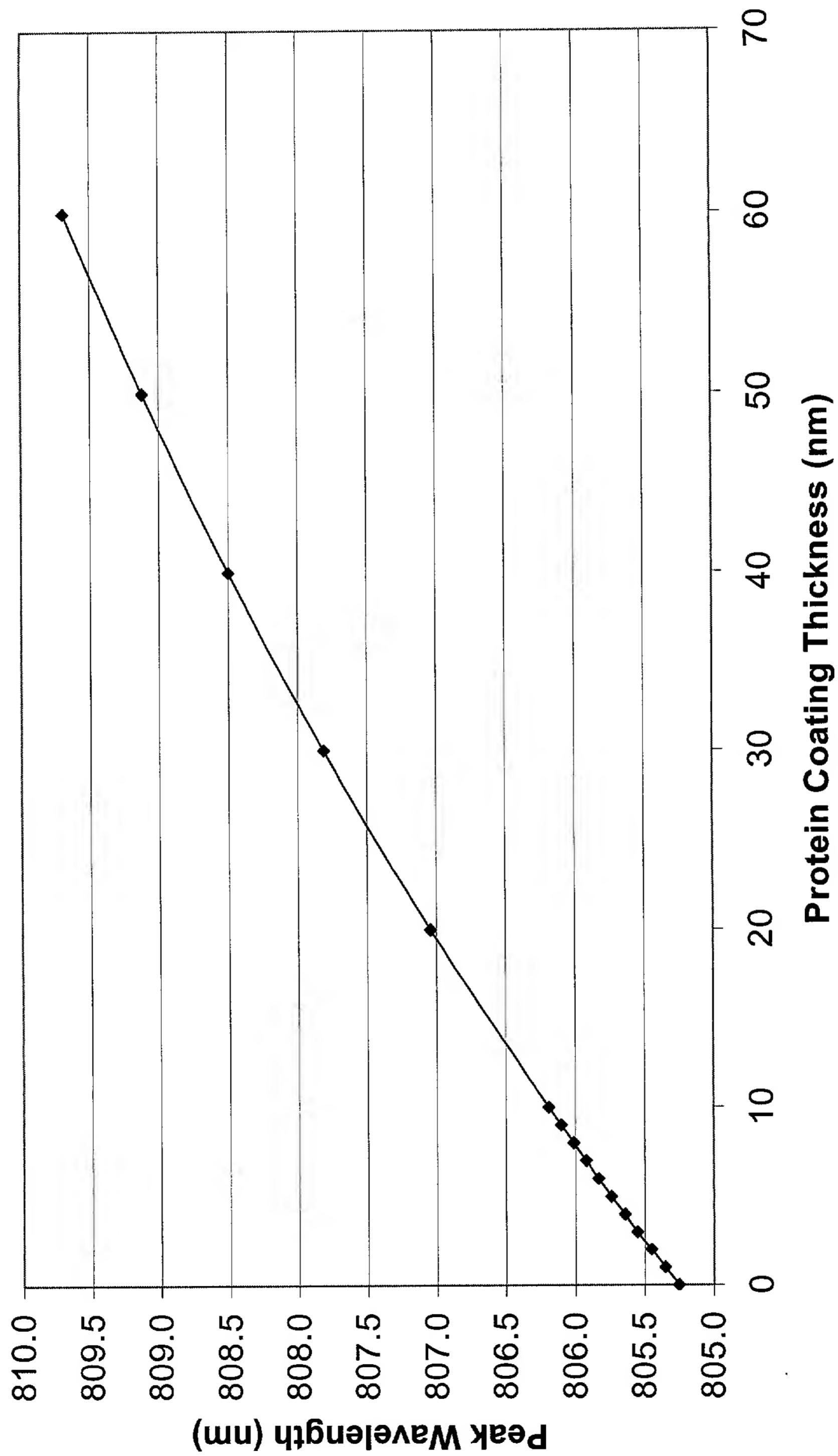


Figure 32

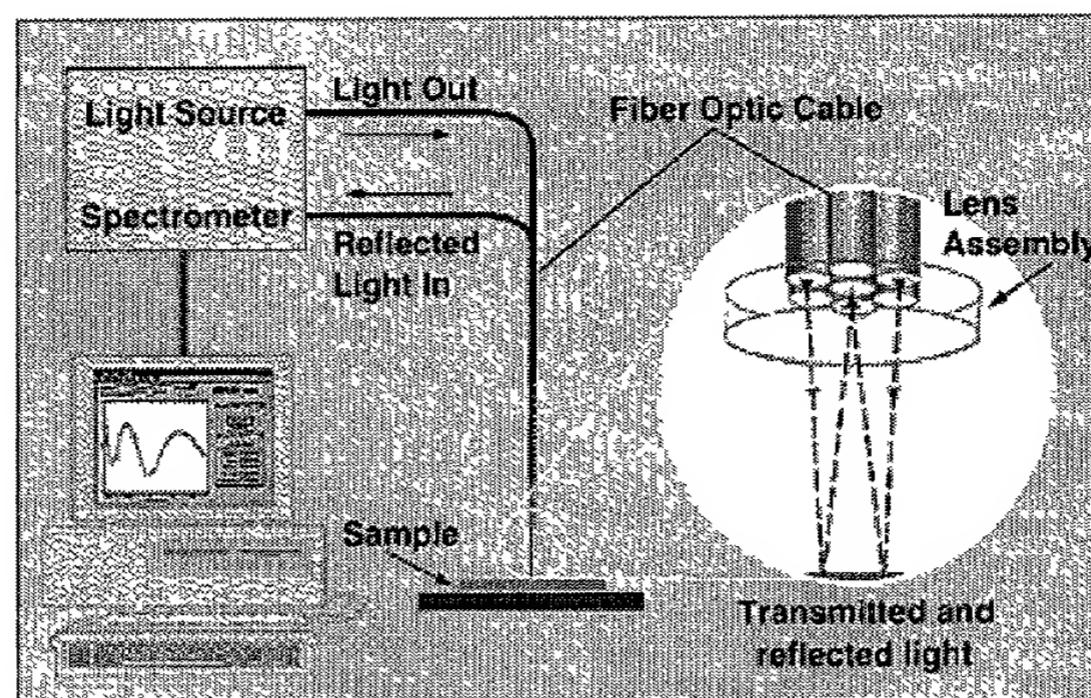


Figure 33

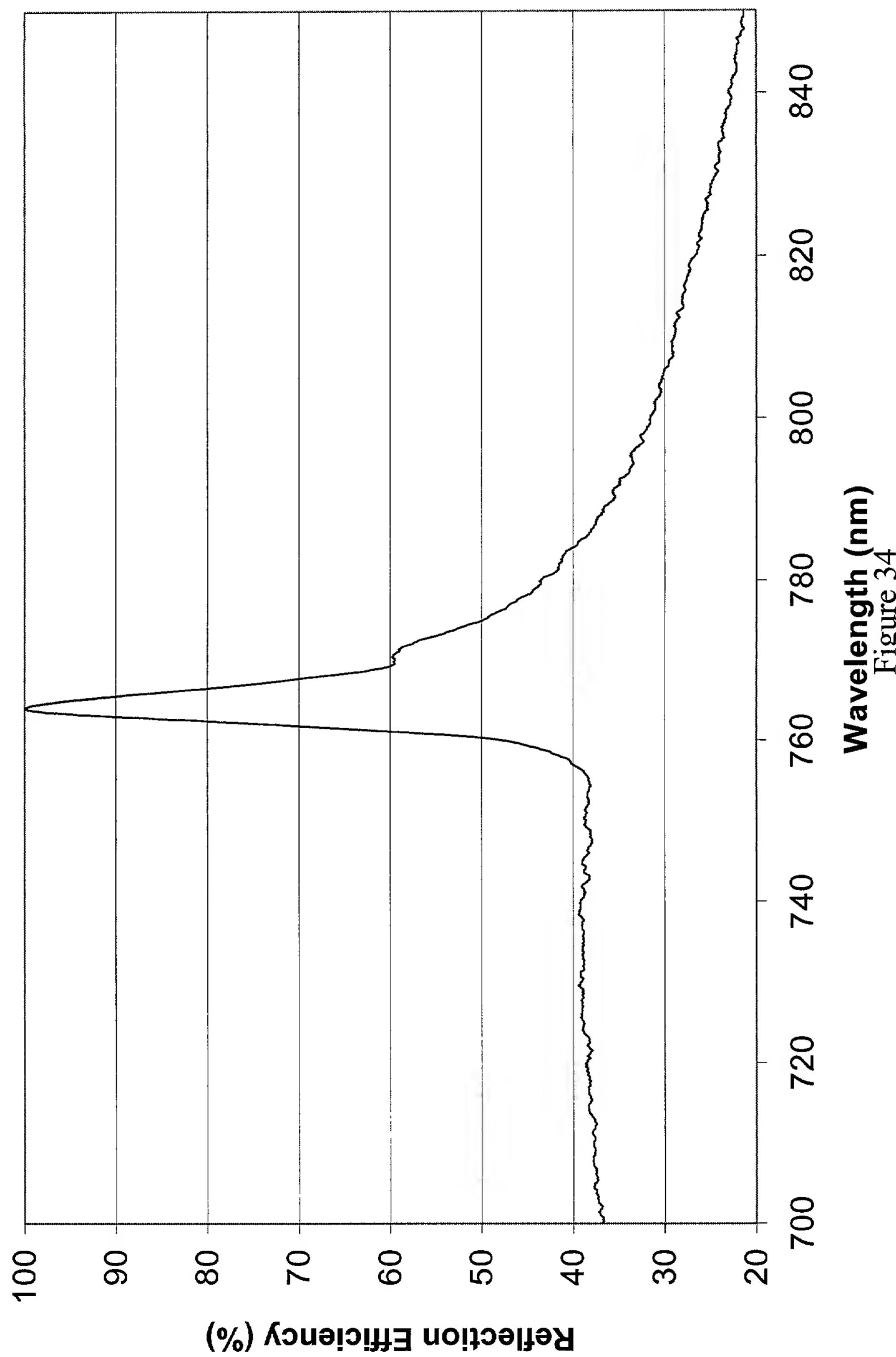
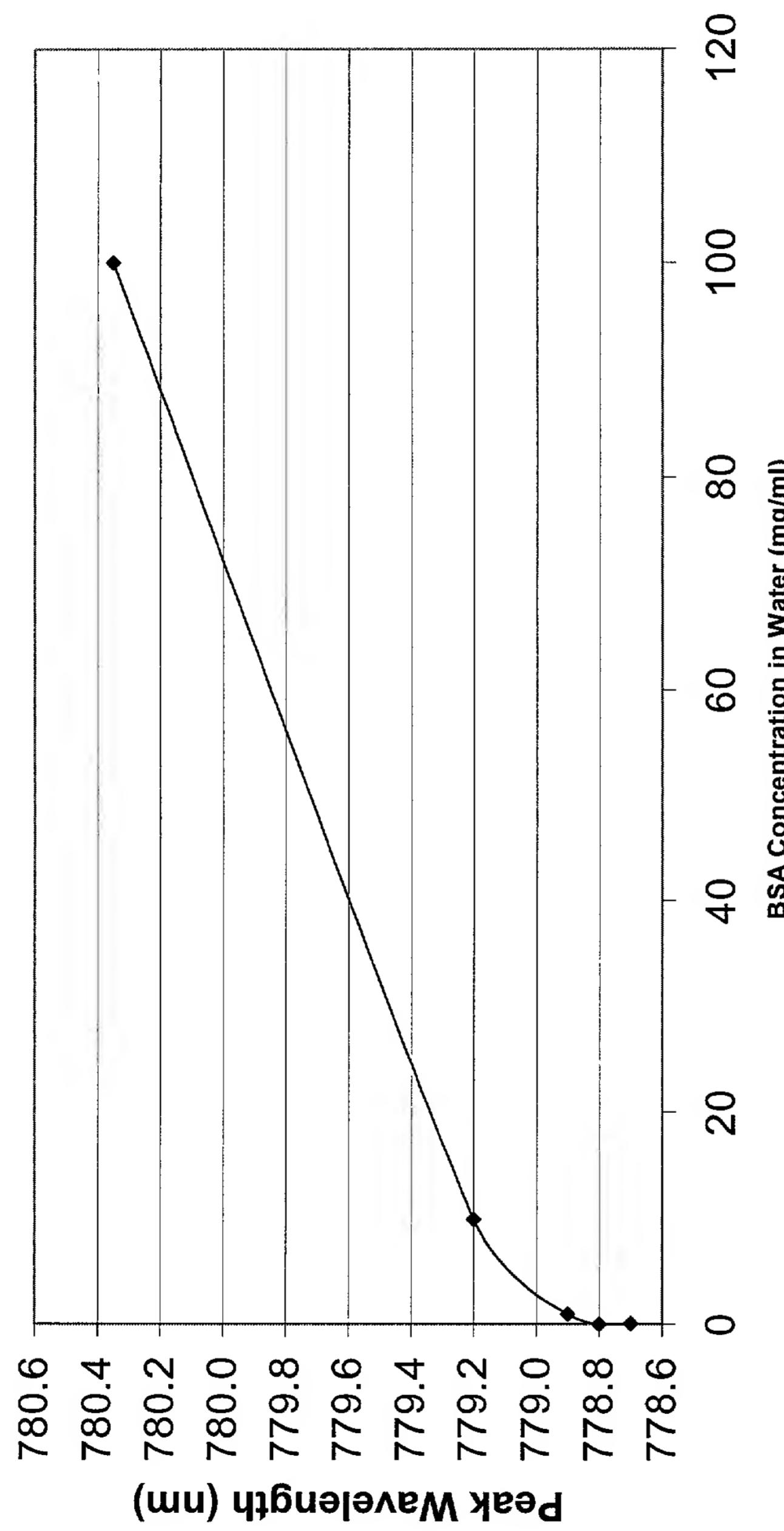
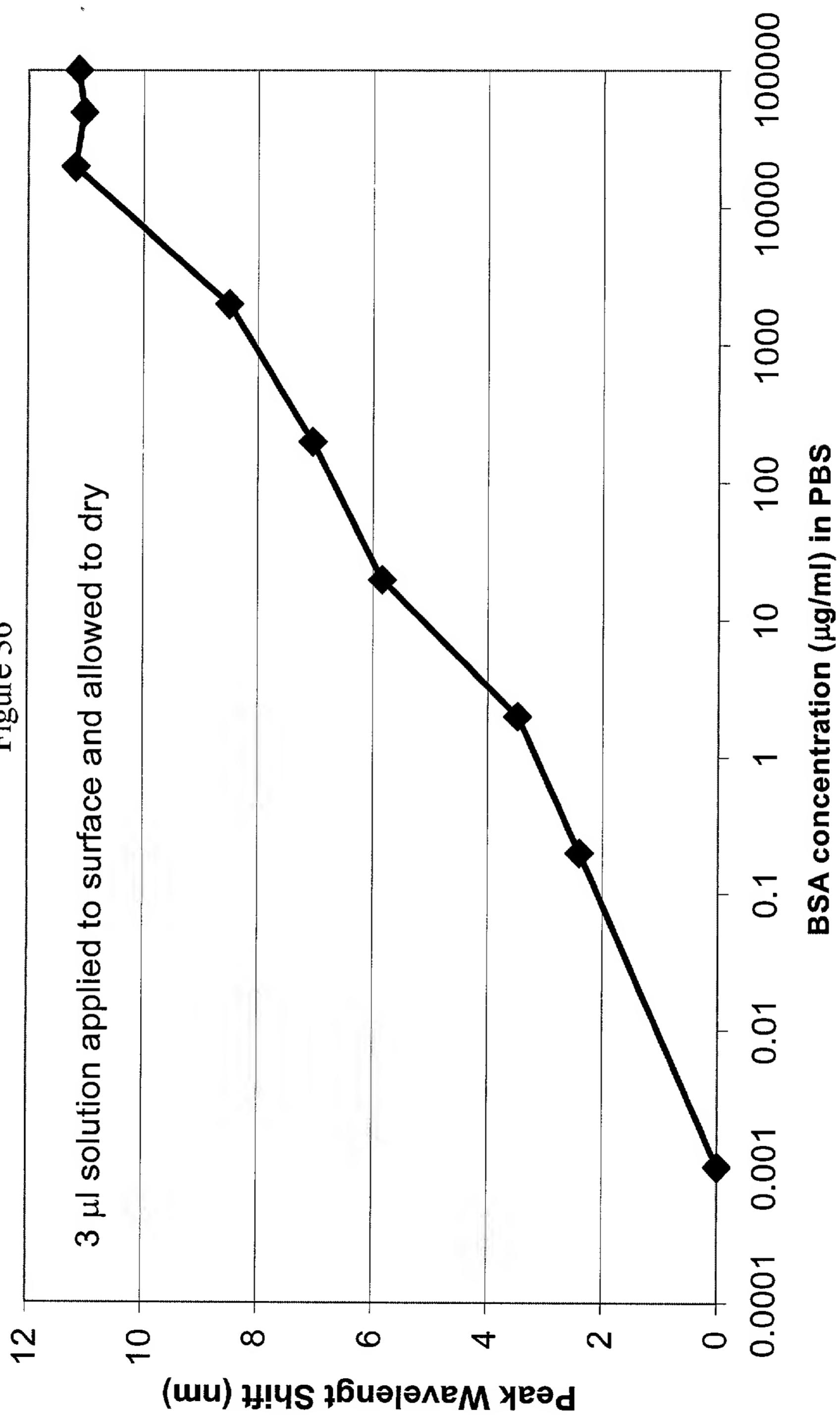


Figure 34  
Wavelength (nm)

Figure 35





**Coated Layer on Sensor**

Biotin      Streptavidin      Biotin-ah-IgG

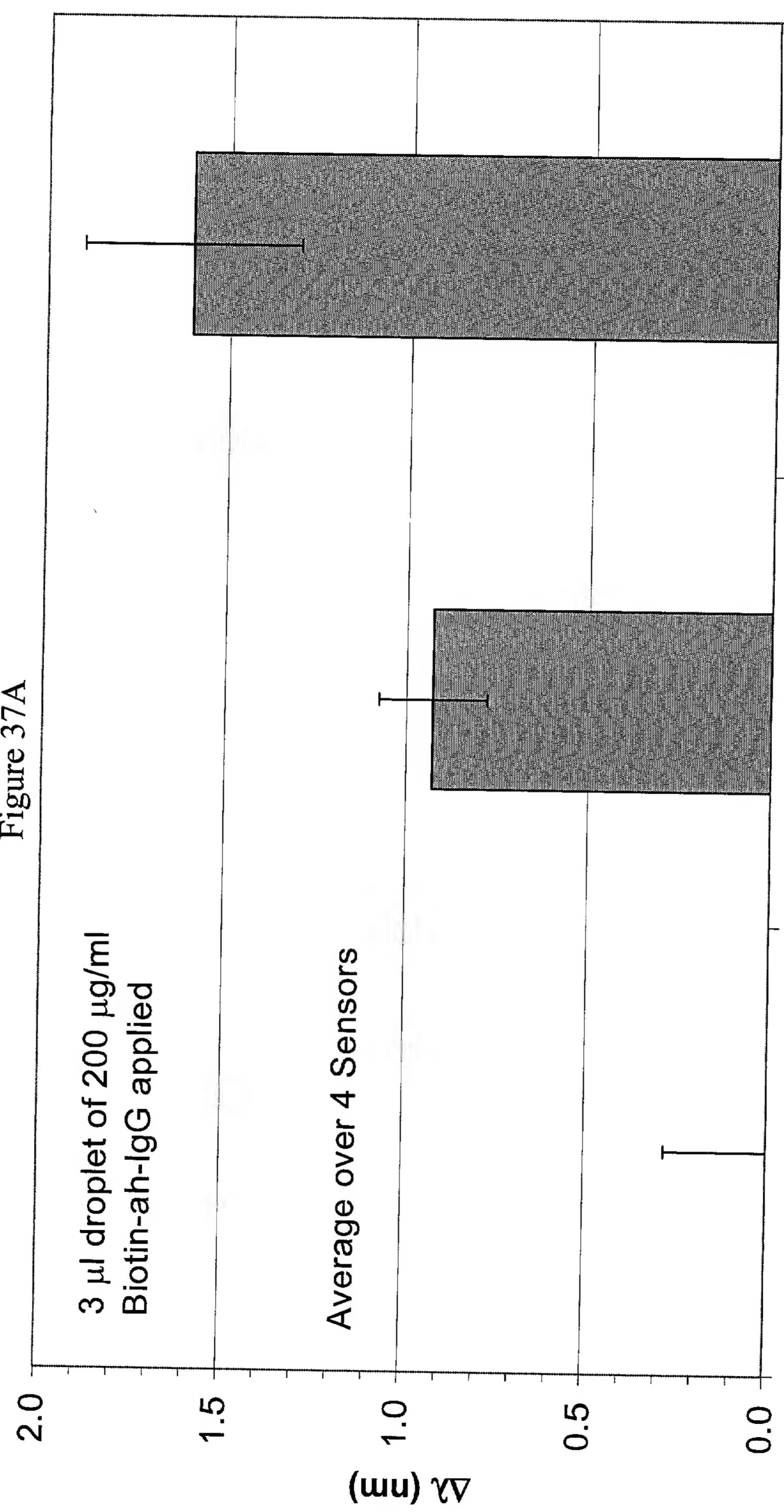
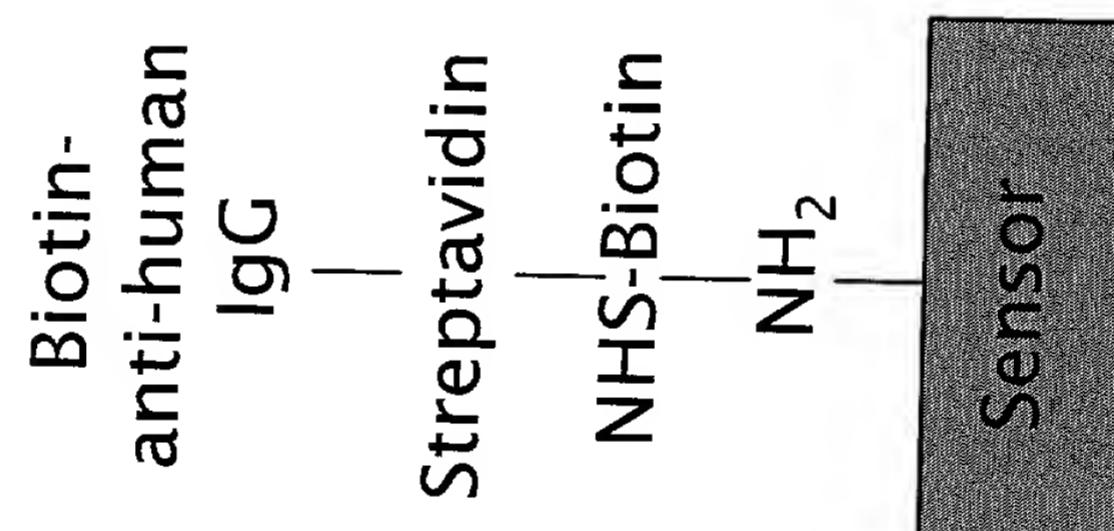


Figure 37B



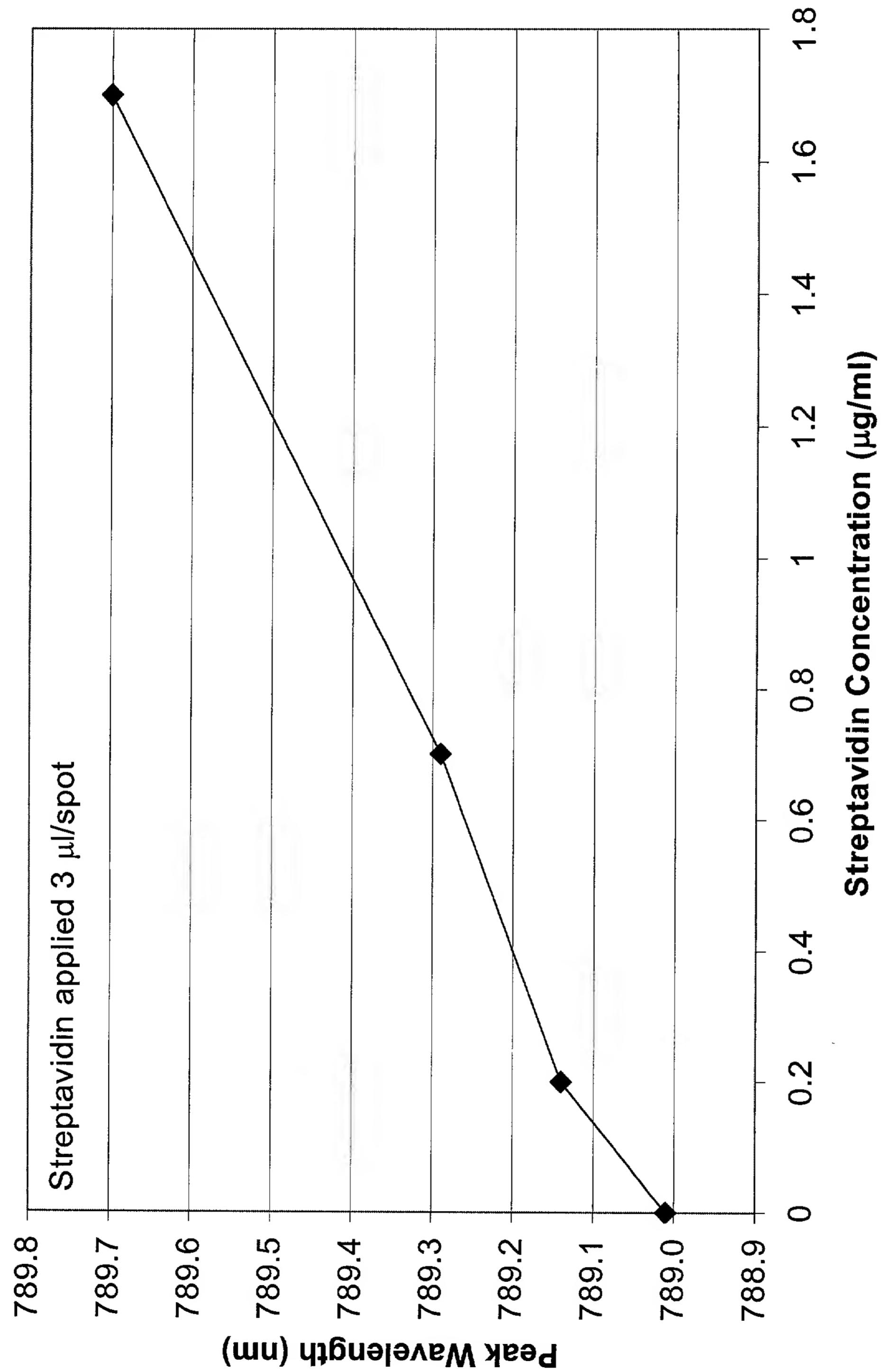
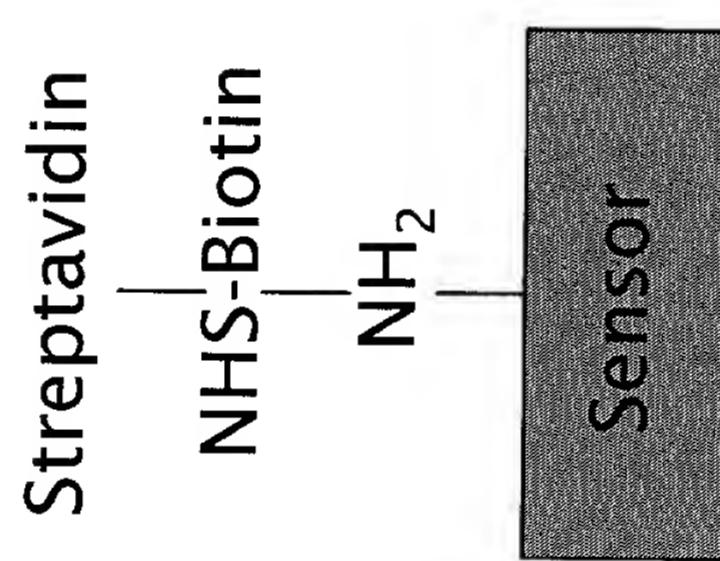


Figure 38A

Figure 38B



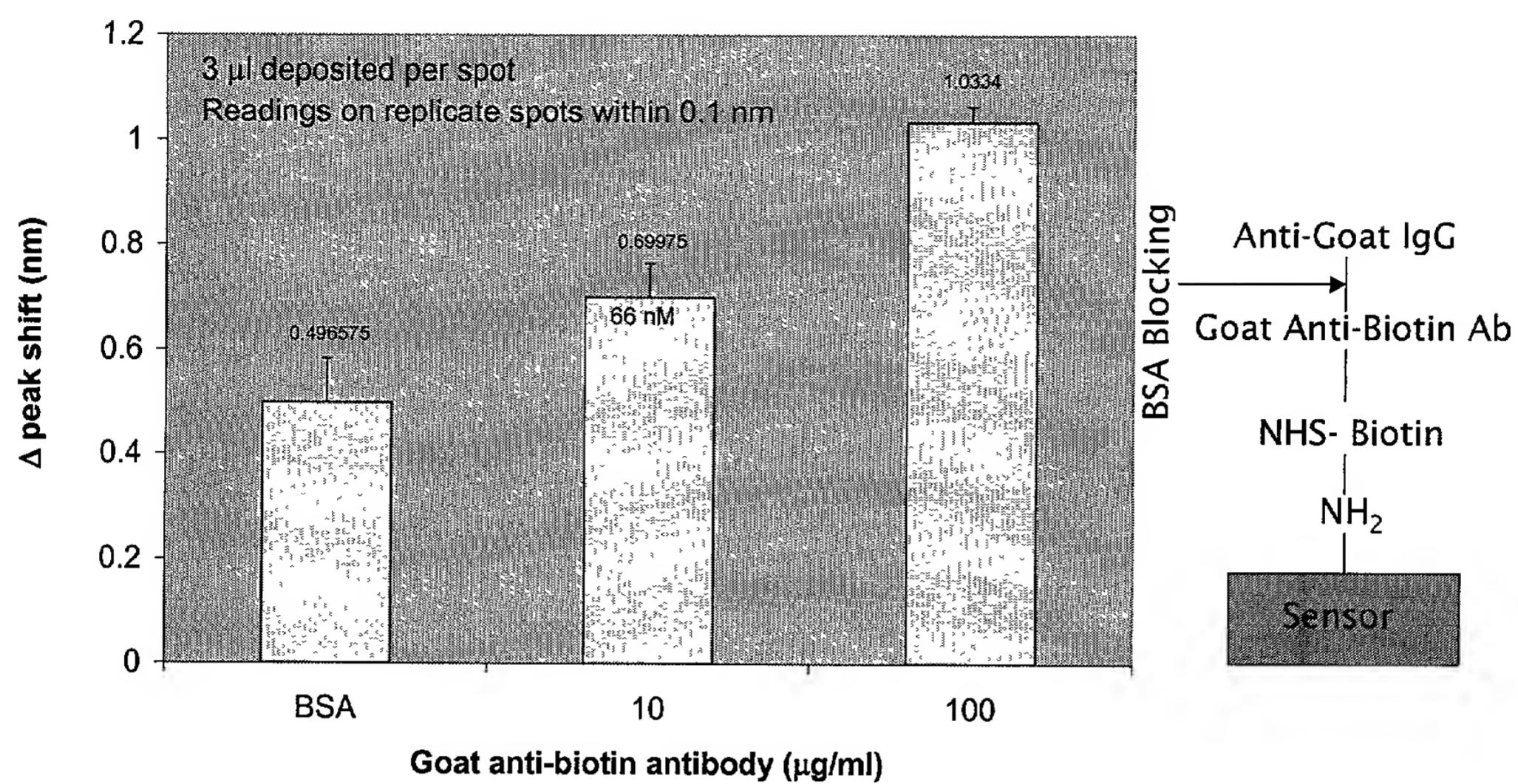


Figure 39A

Figure 39B

Figure 39

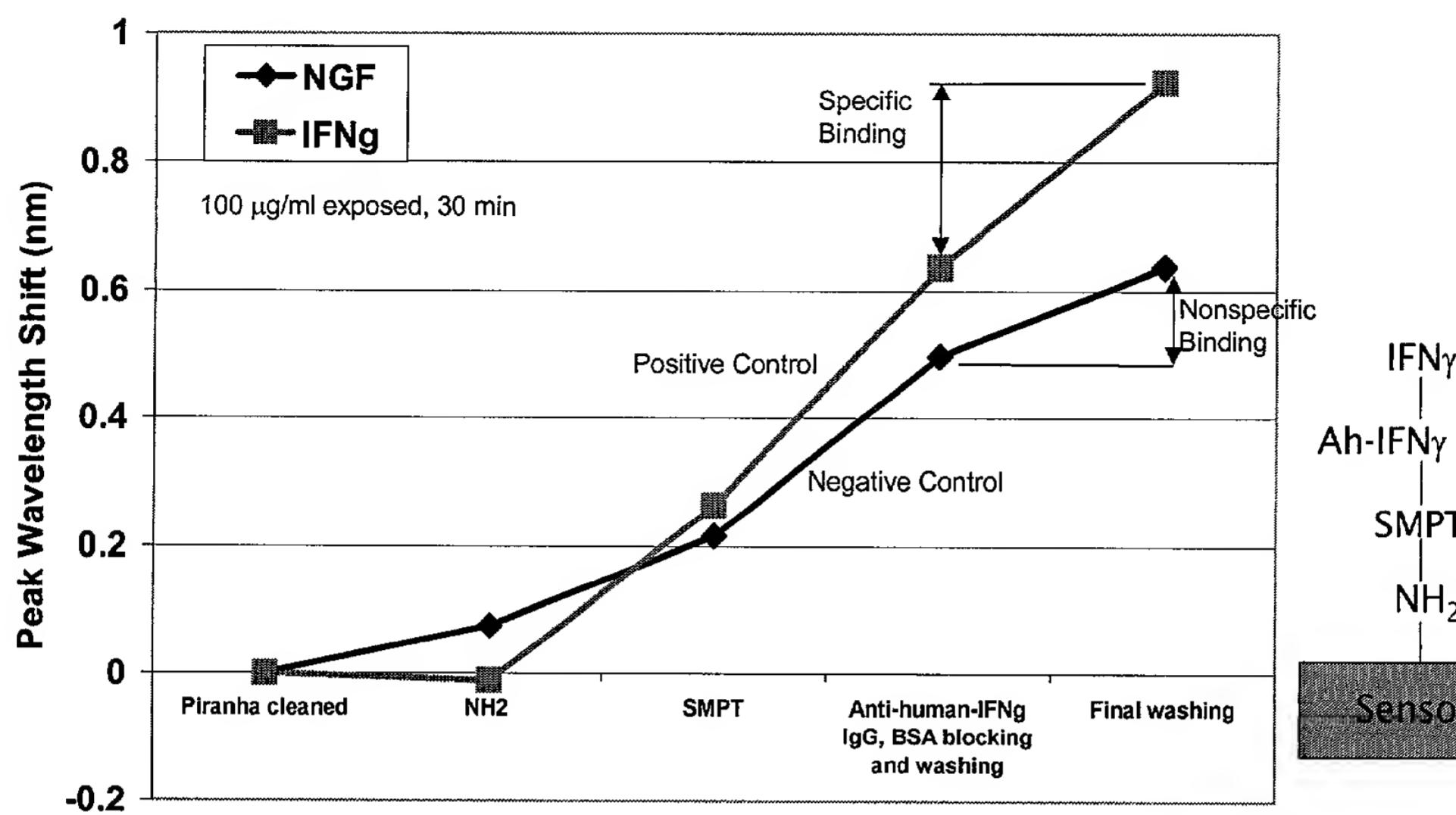
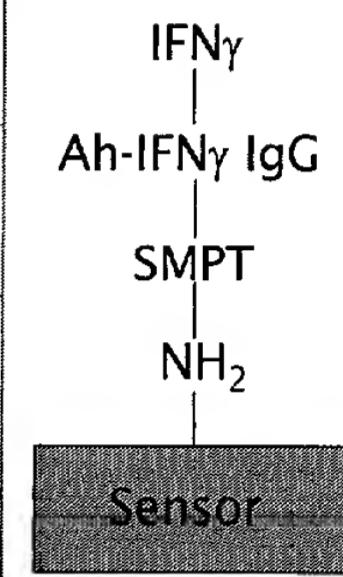


Figure 40A

Figure 40B

Figure 40



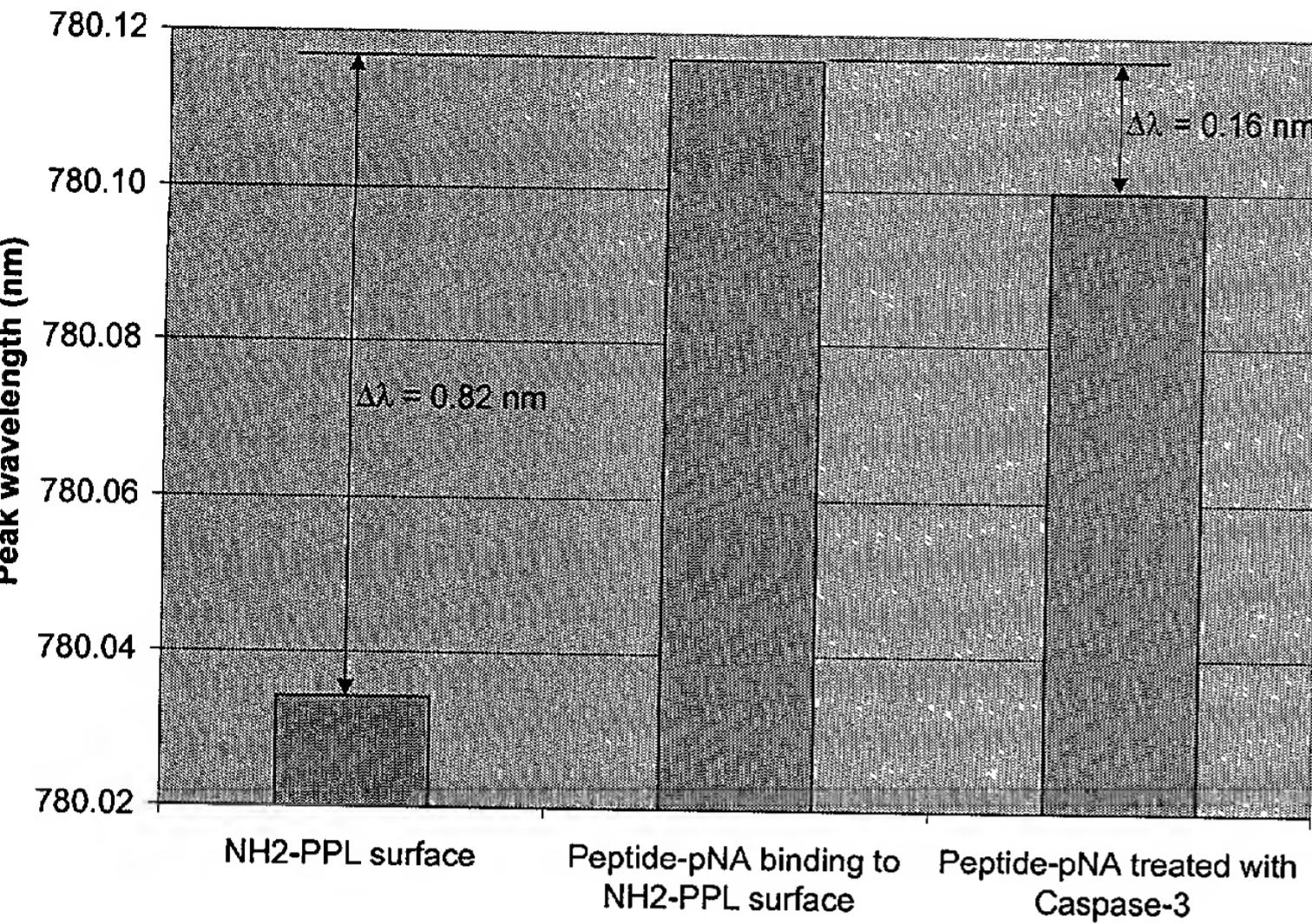


Figure 41A

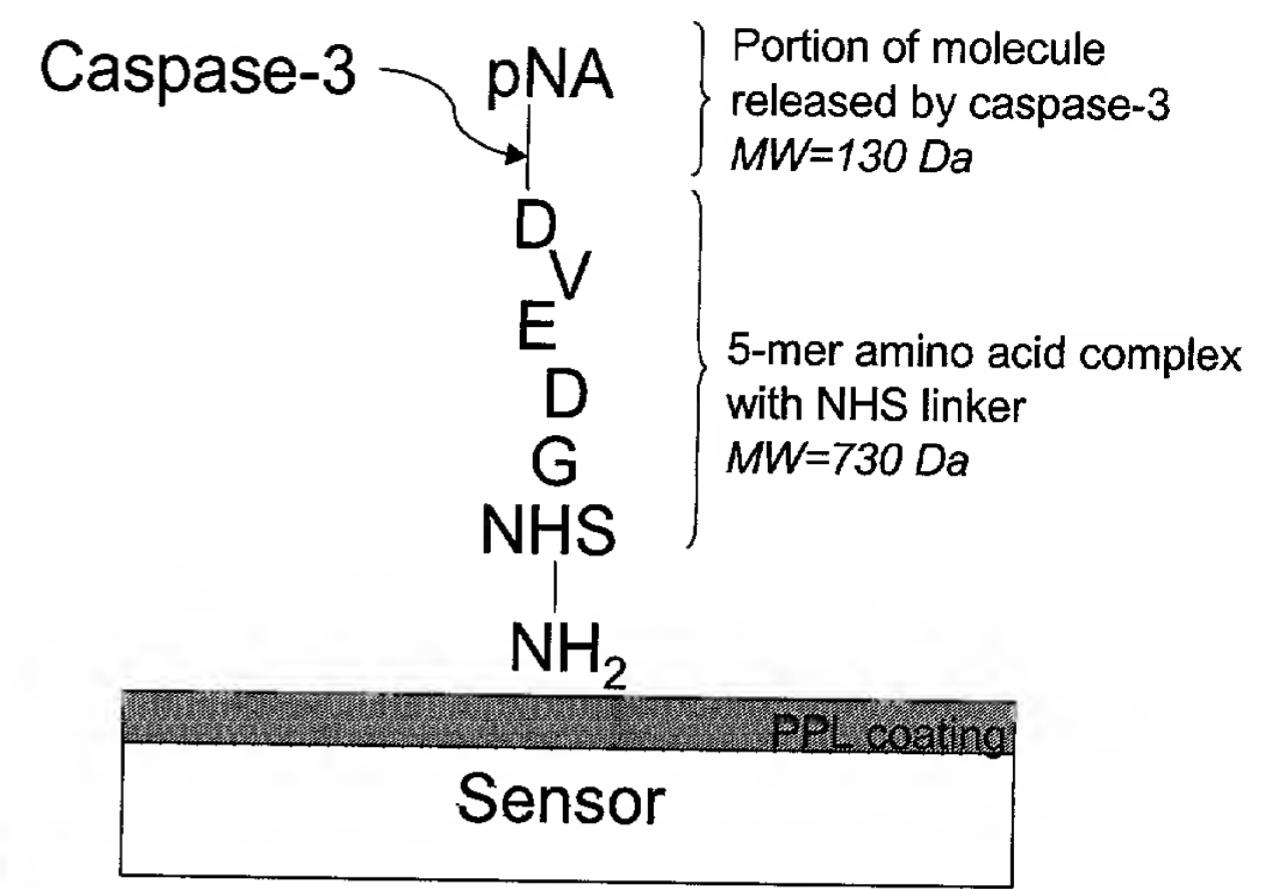


Figure 41B

Figure 41

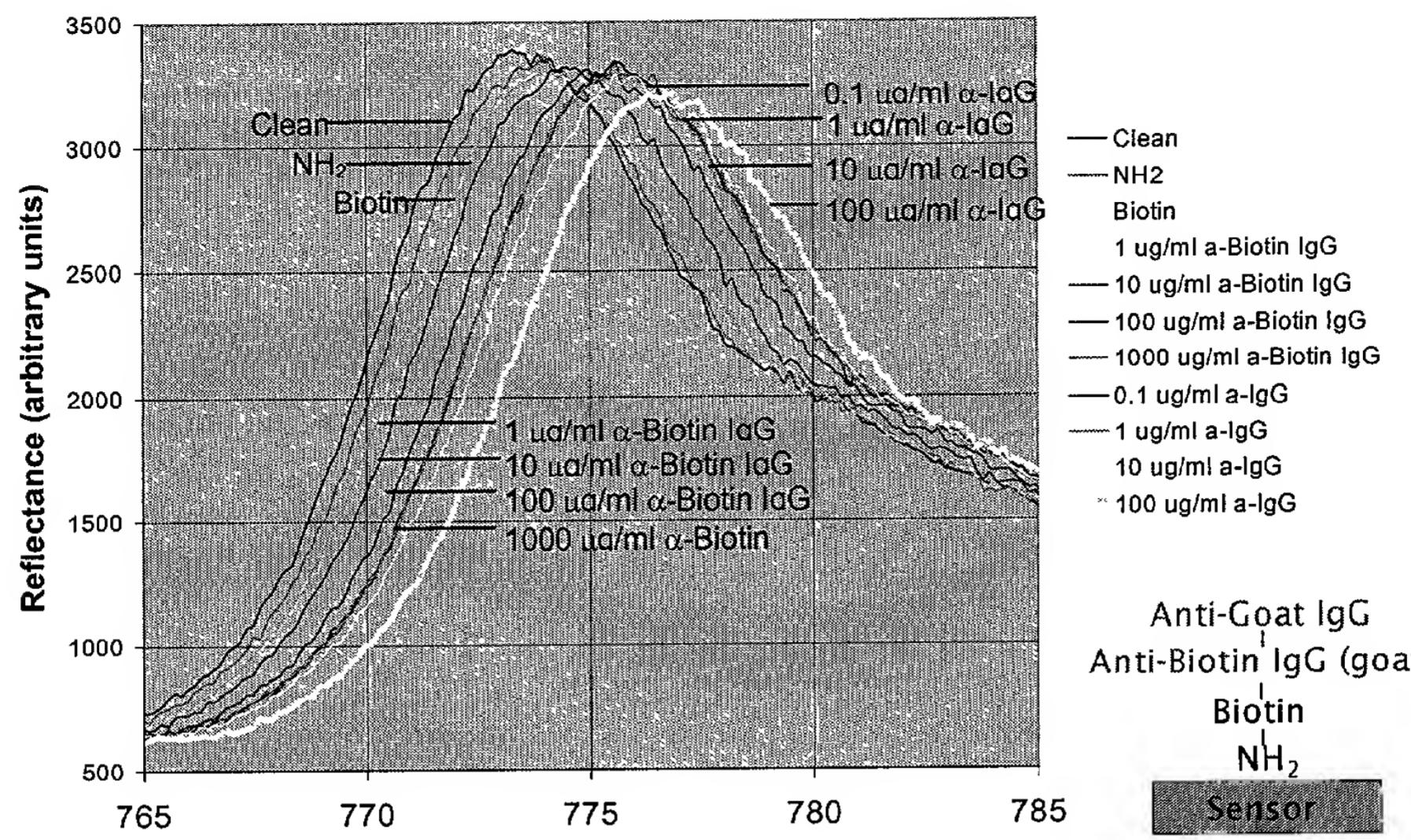


Figure 42A

Figure 42

Anti-Goat IgG  
Anti-Biotin IgG (goat)  
Biotin  
 $\text{NH}_2$   
Sensor

Figure 42B

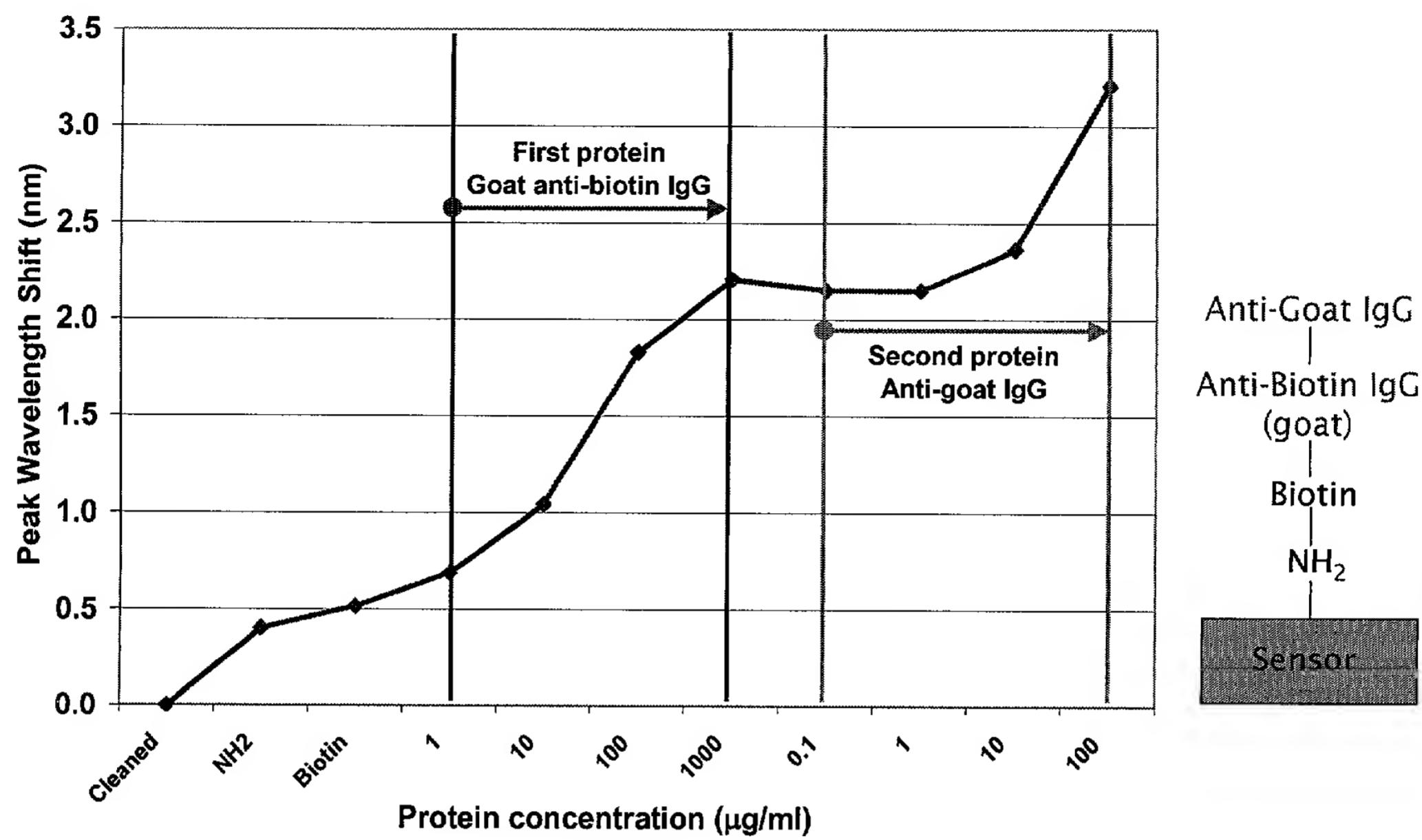


Figure 43

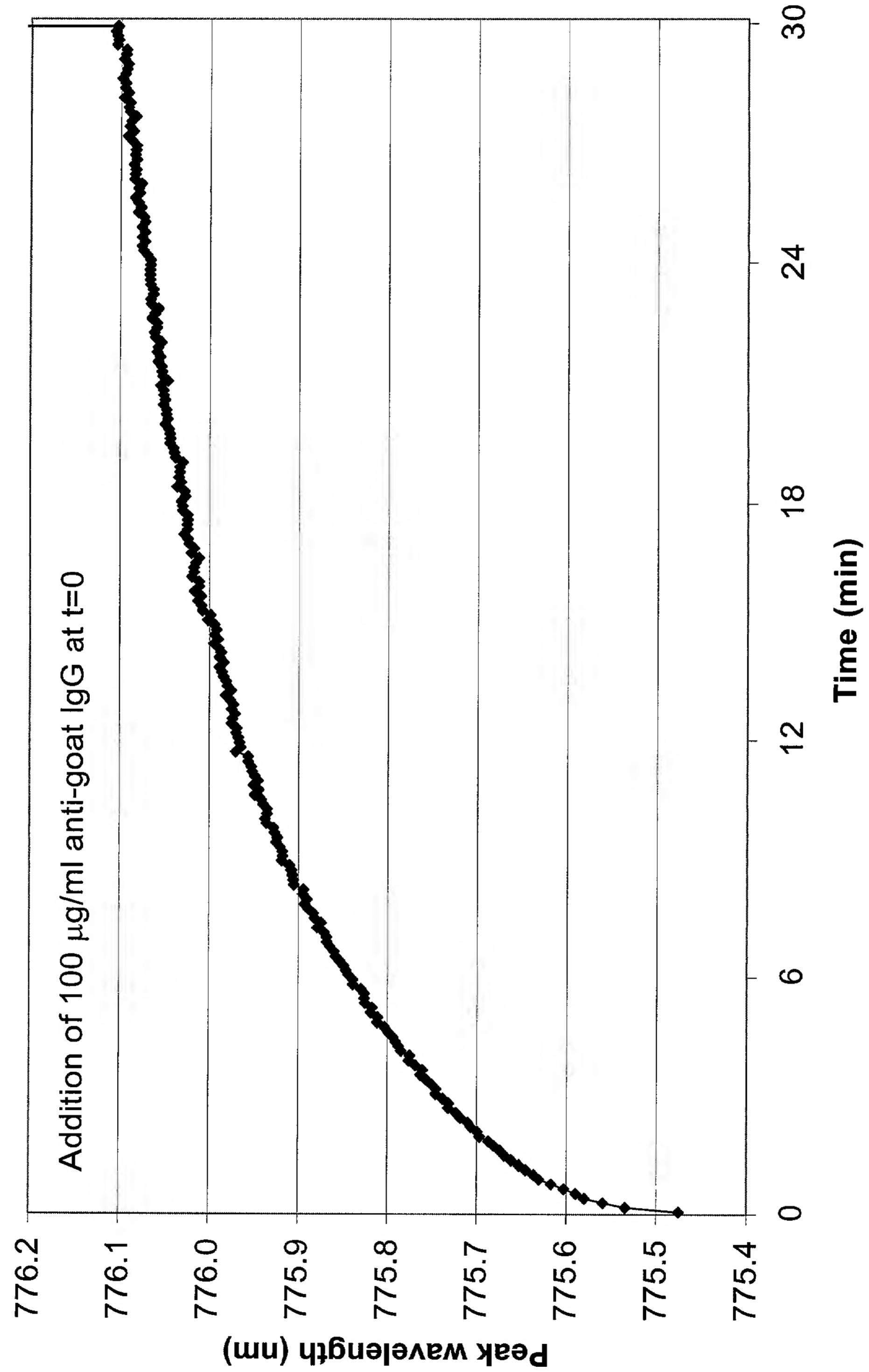
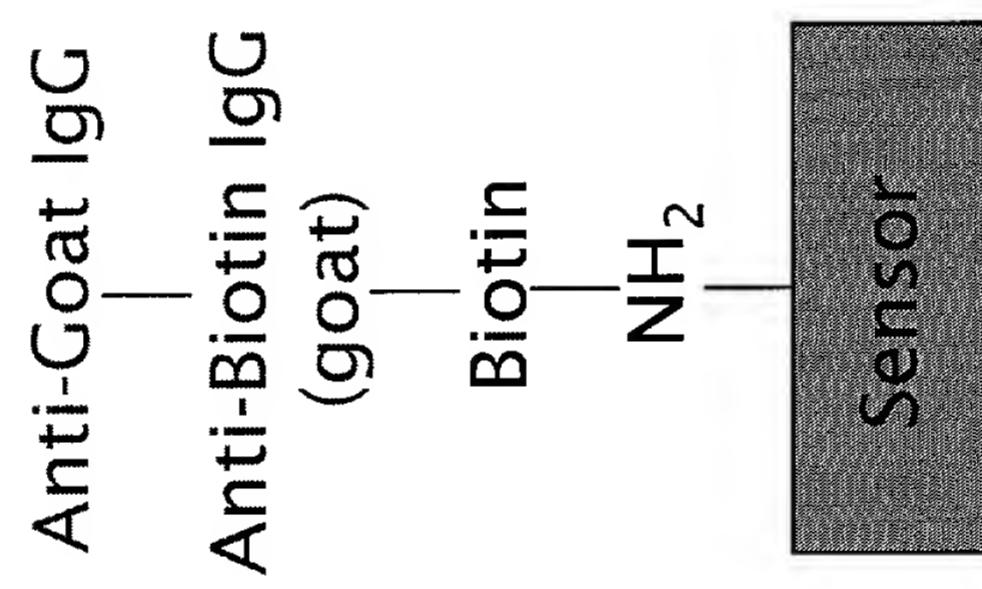


Figure 44A

Figure 44B



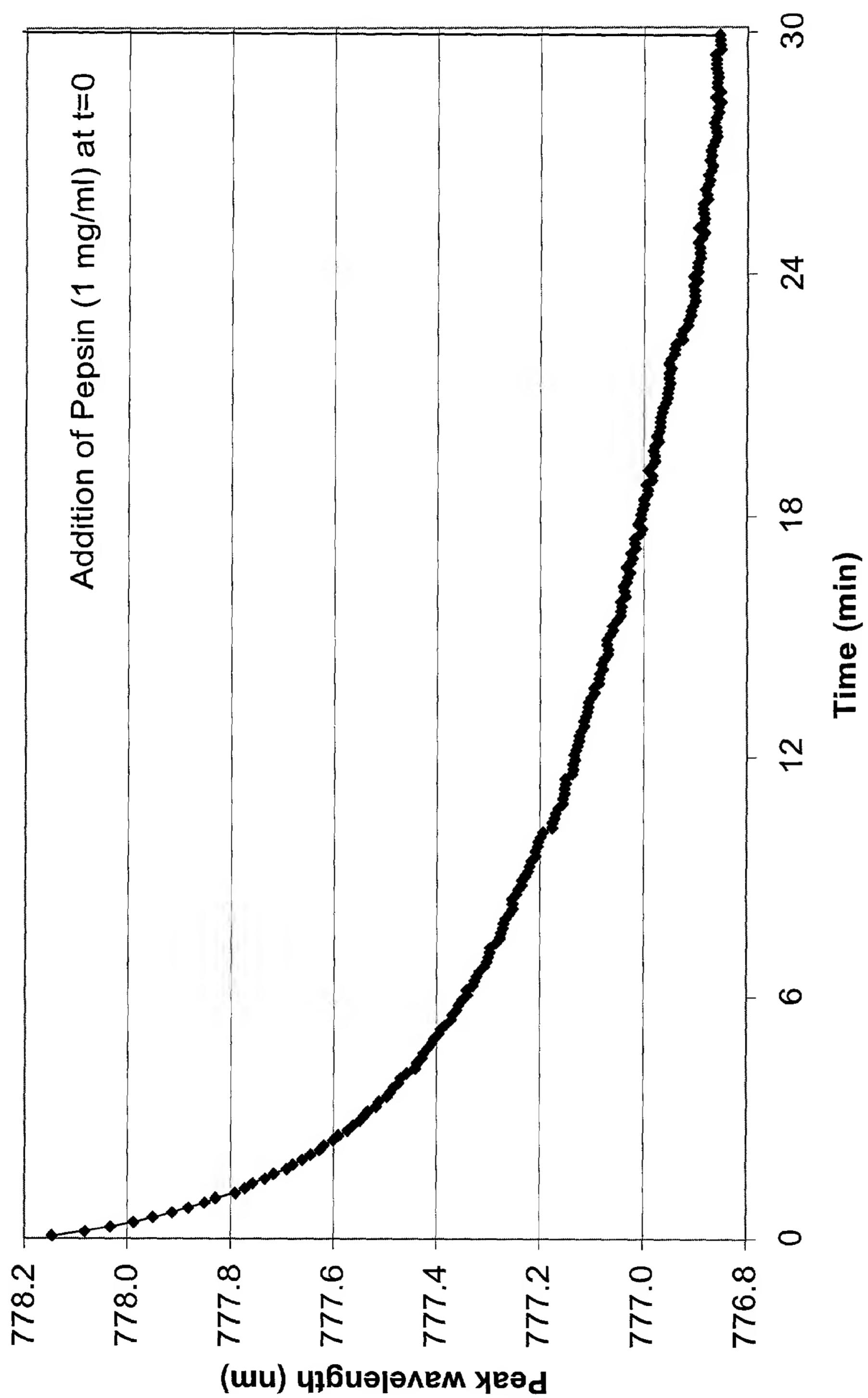
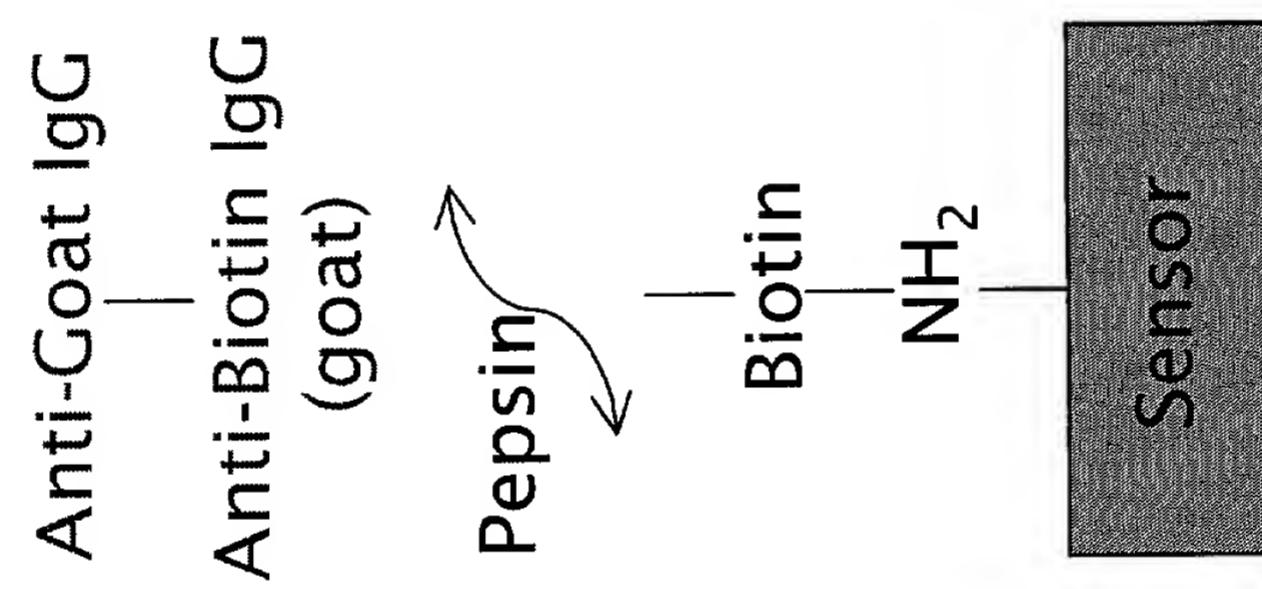


Figure 45A

Figure 45B



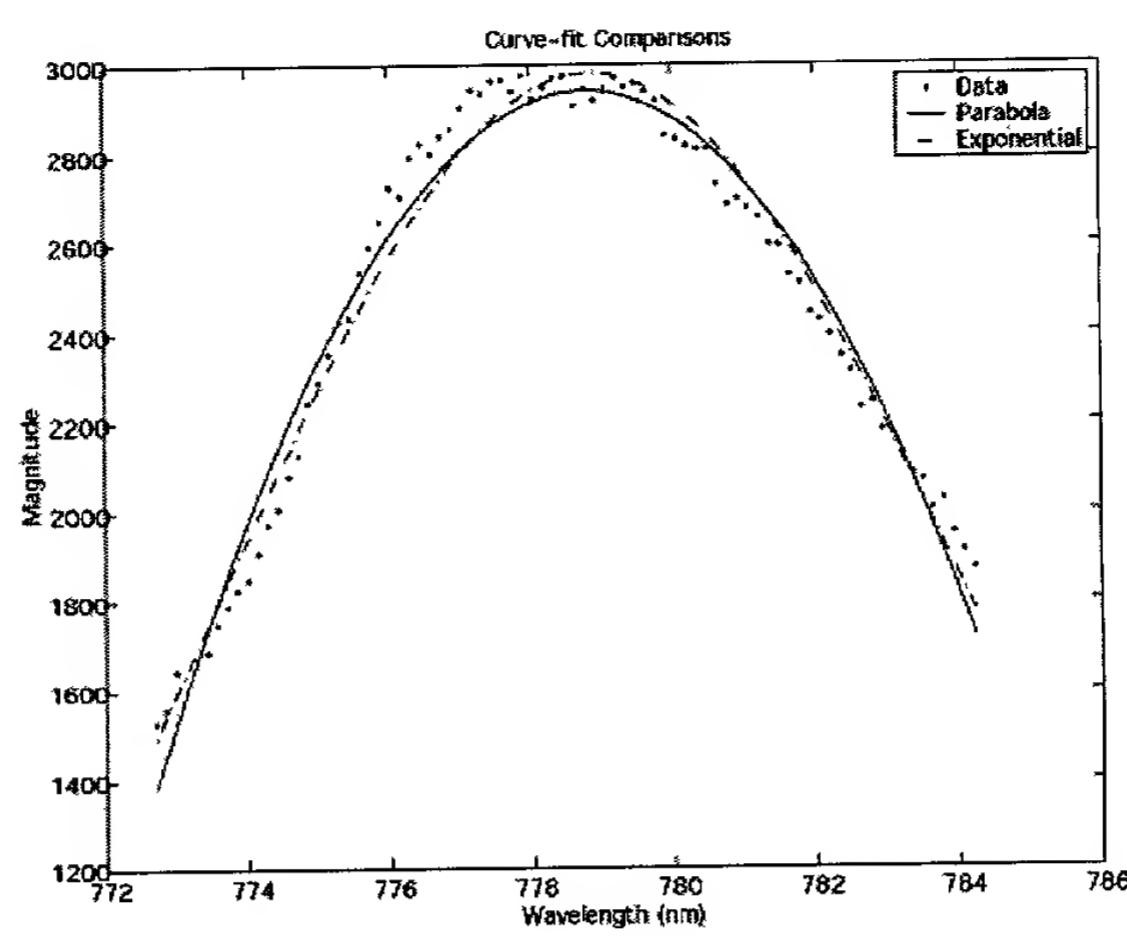


Figure 46

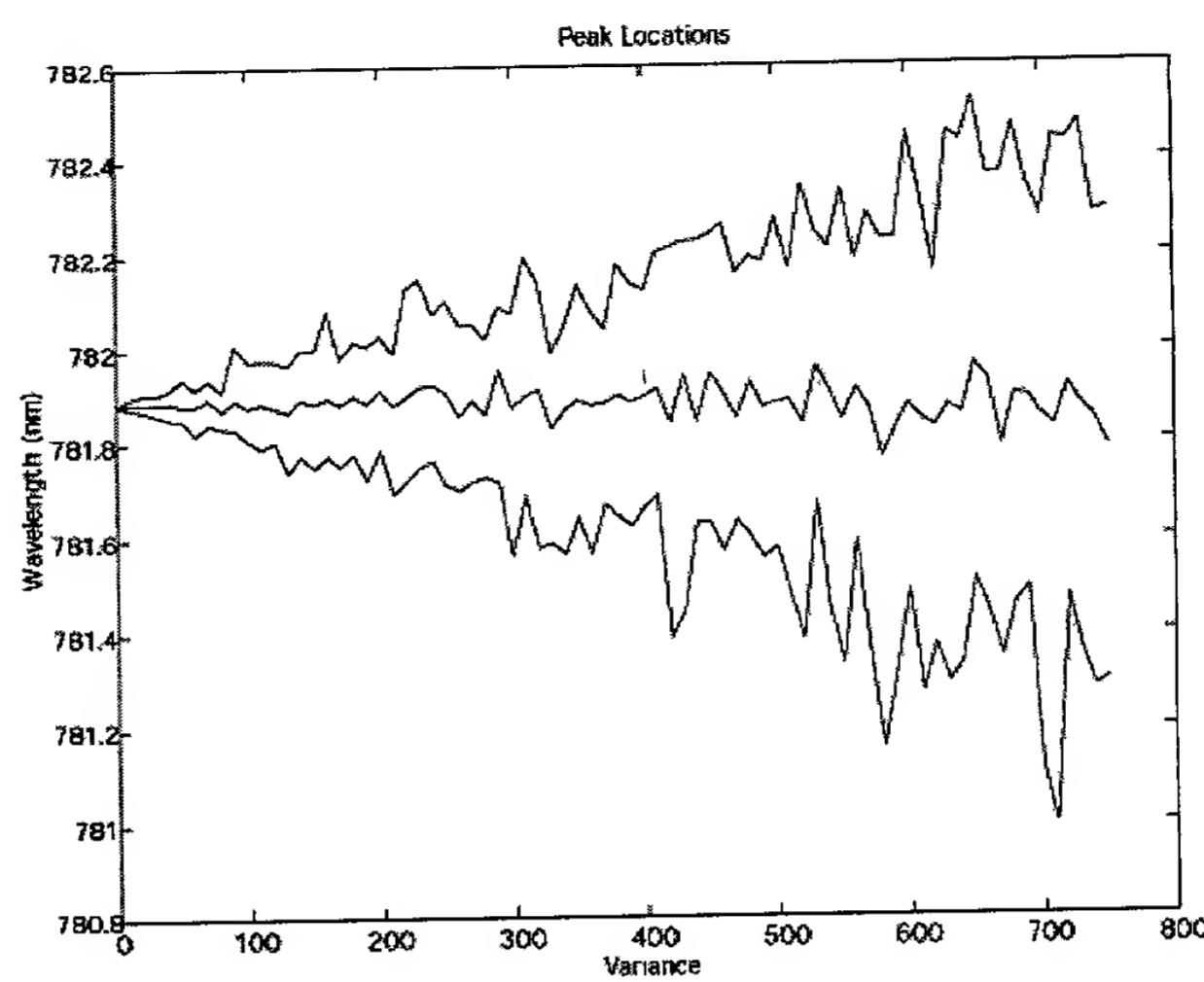
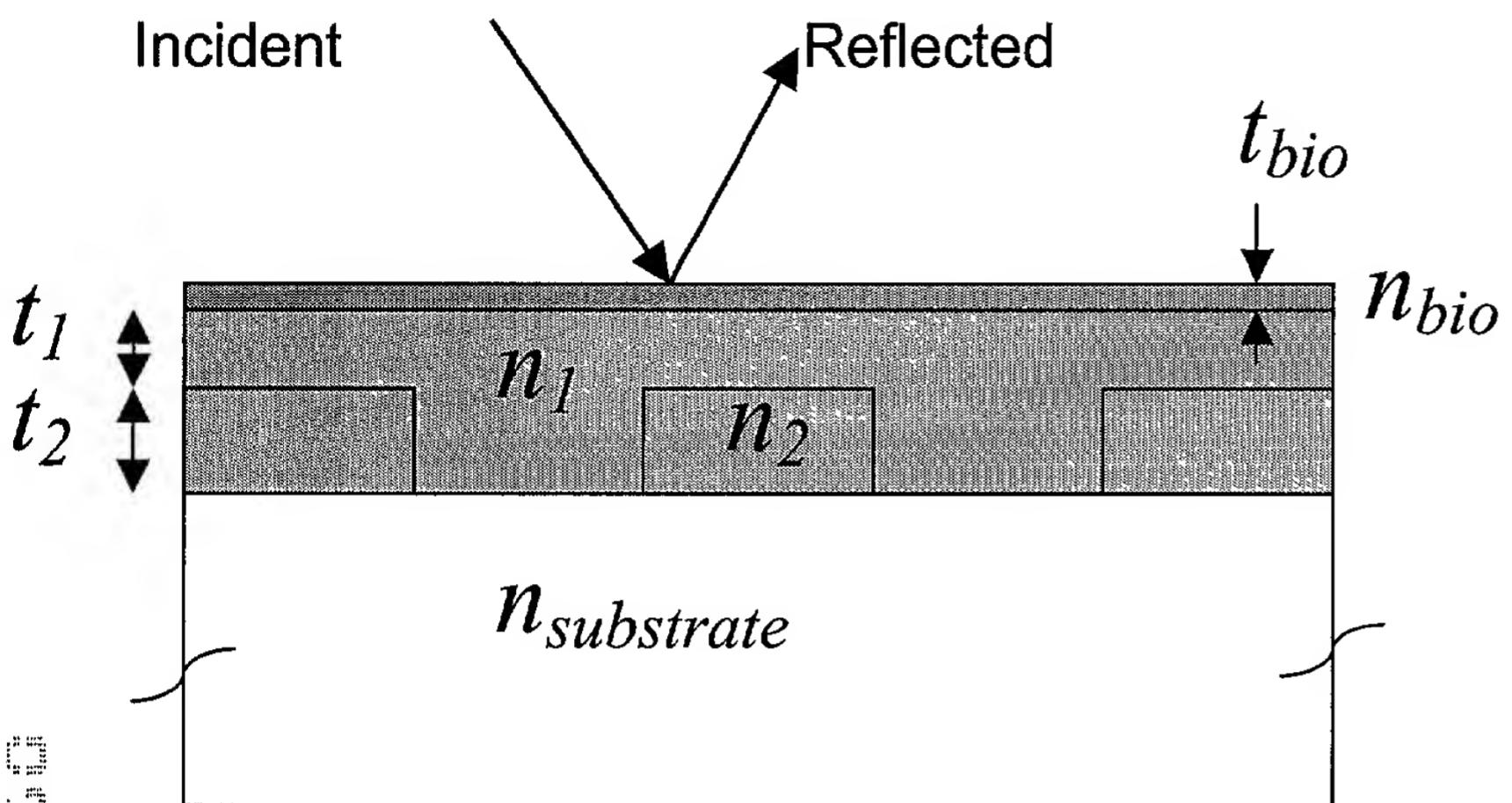


Figure 47



Material 1 = Electrical Insulator (photoresist, epoxy, glass)

Material 2 = Indium tin oxide conductor

Substrate = Glass

FIGURE 48

# Concentric Circle Design

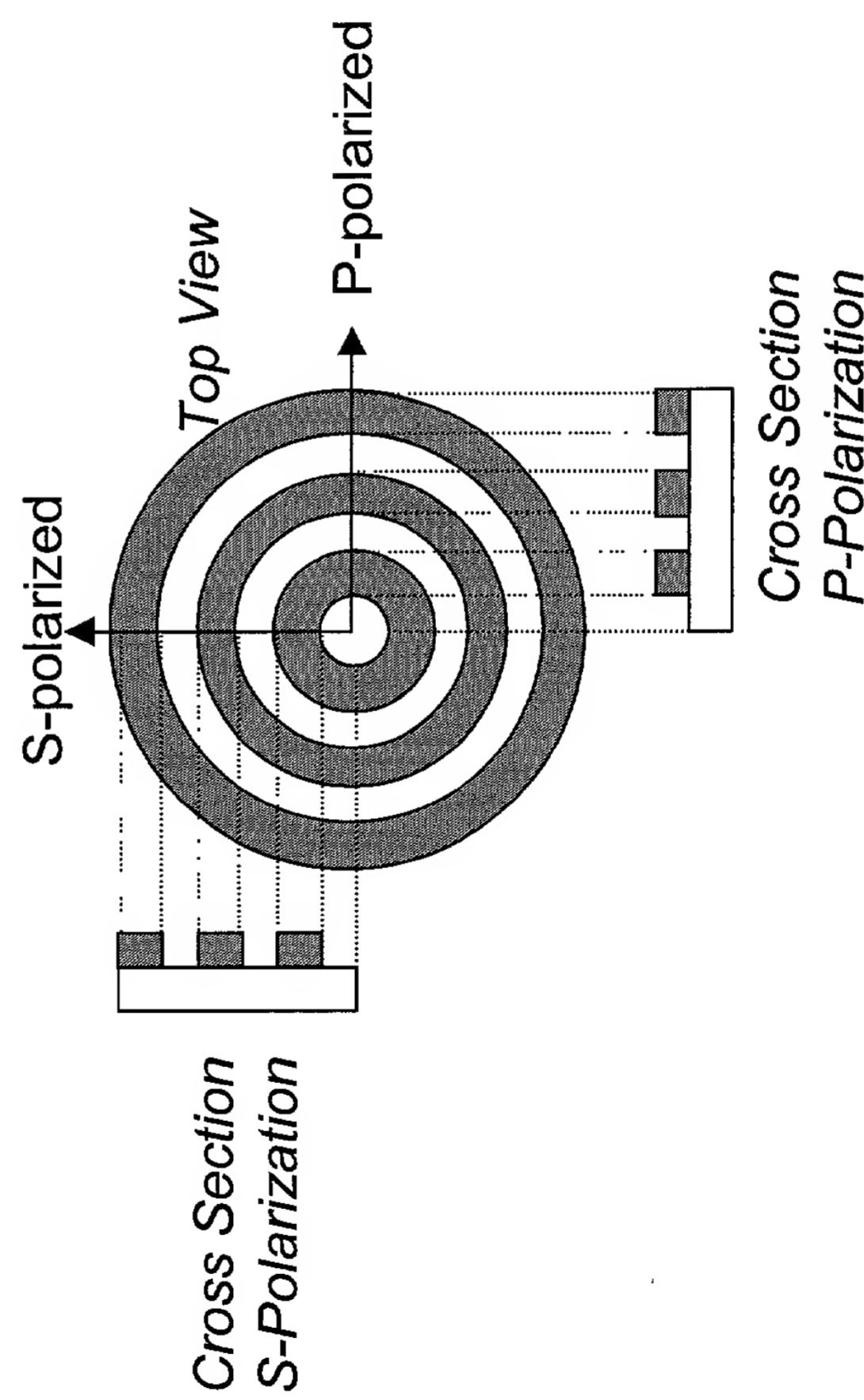


Figure 49

**Figure 50**  
**Hexagonal Grid Design**

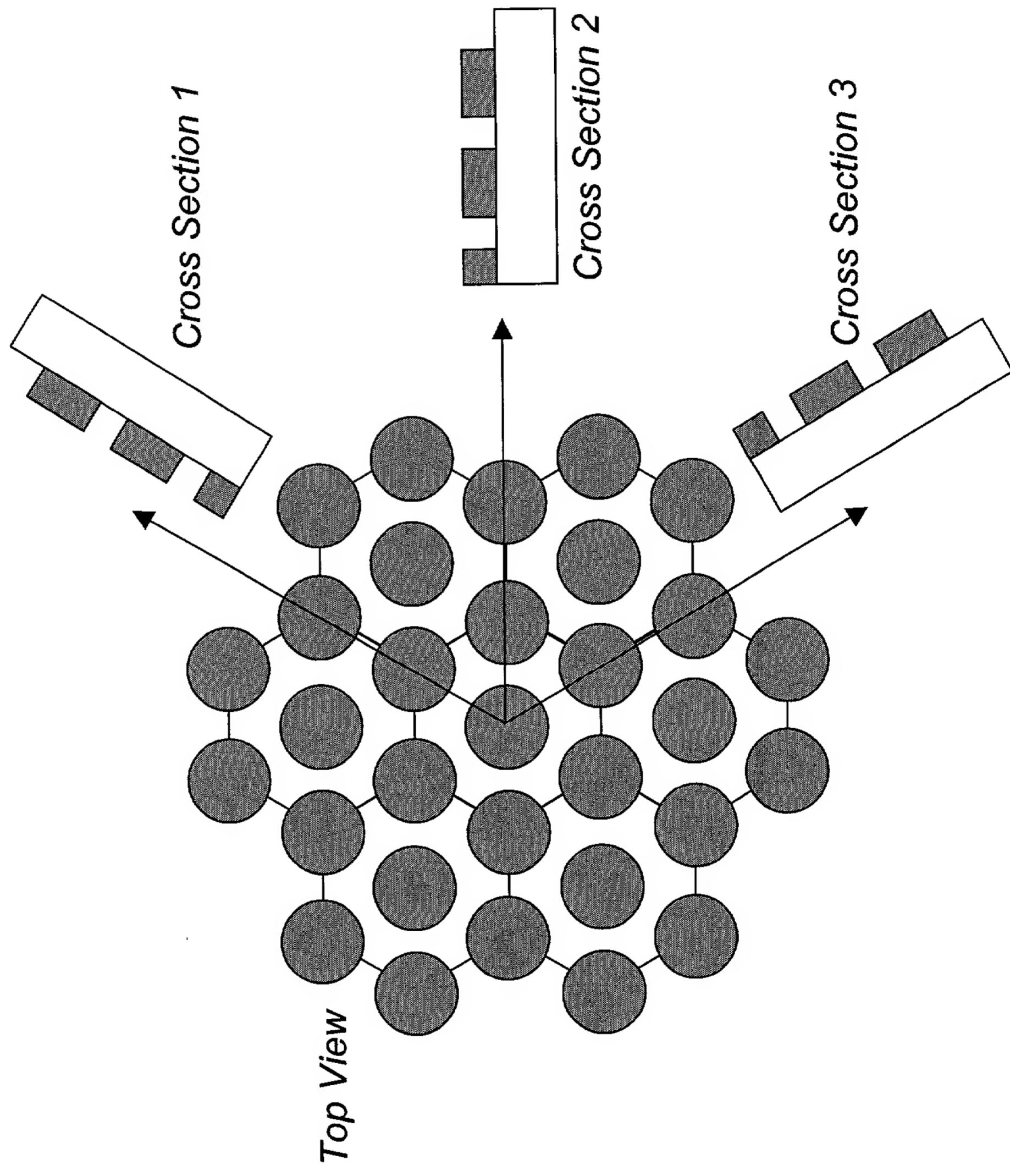
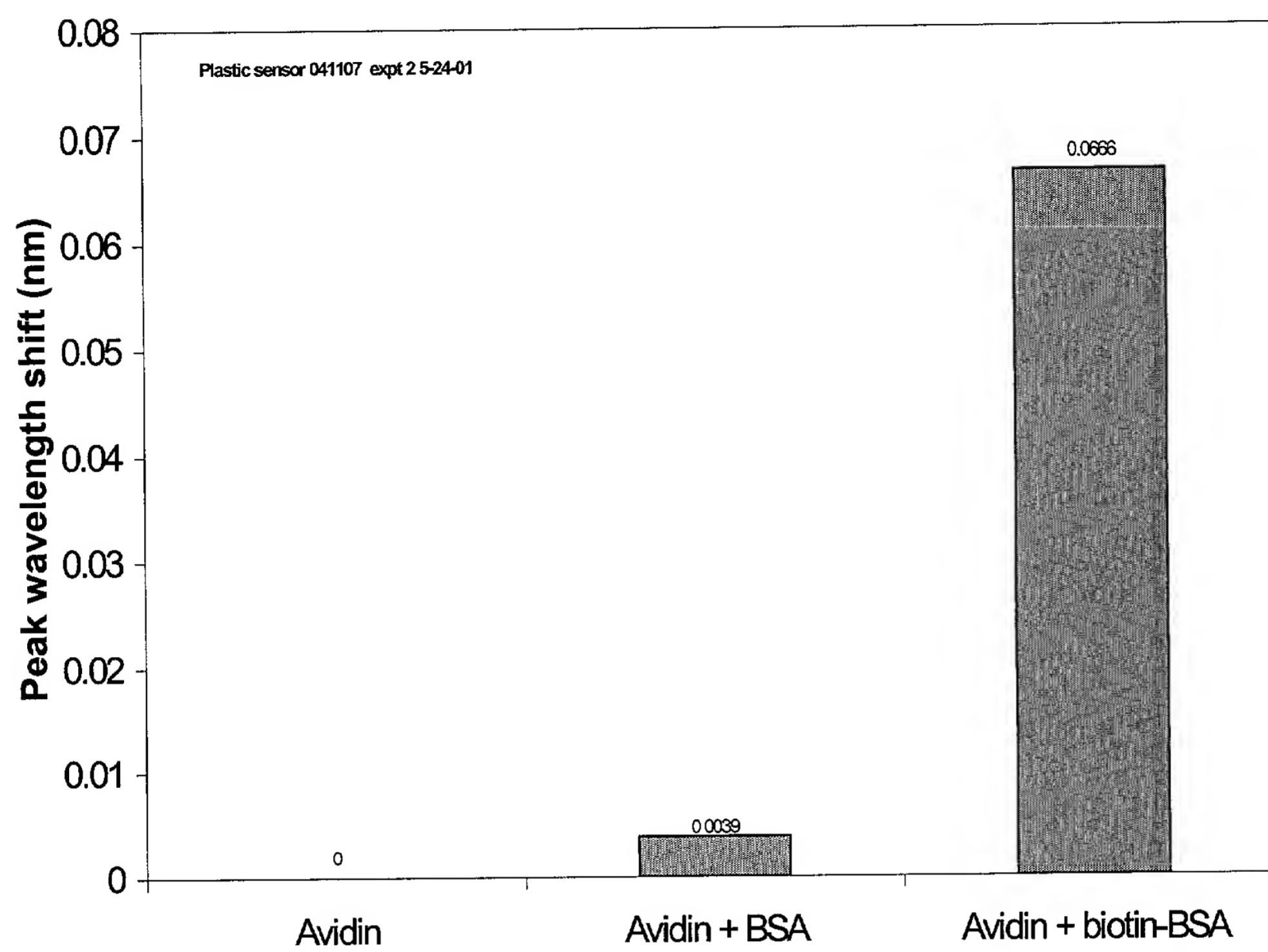


Figure 51



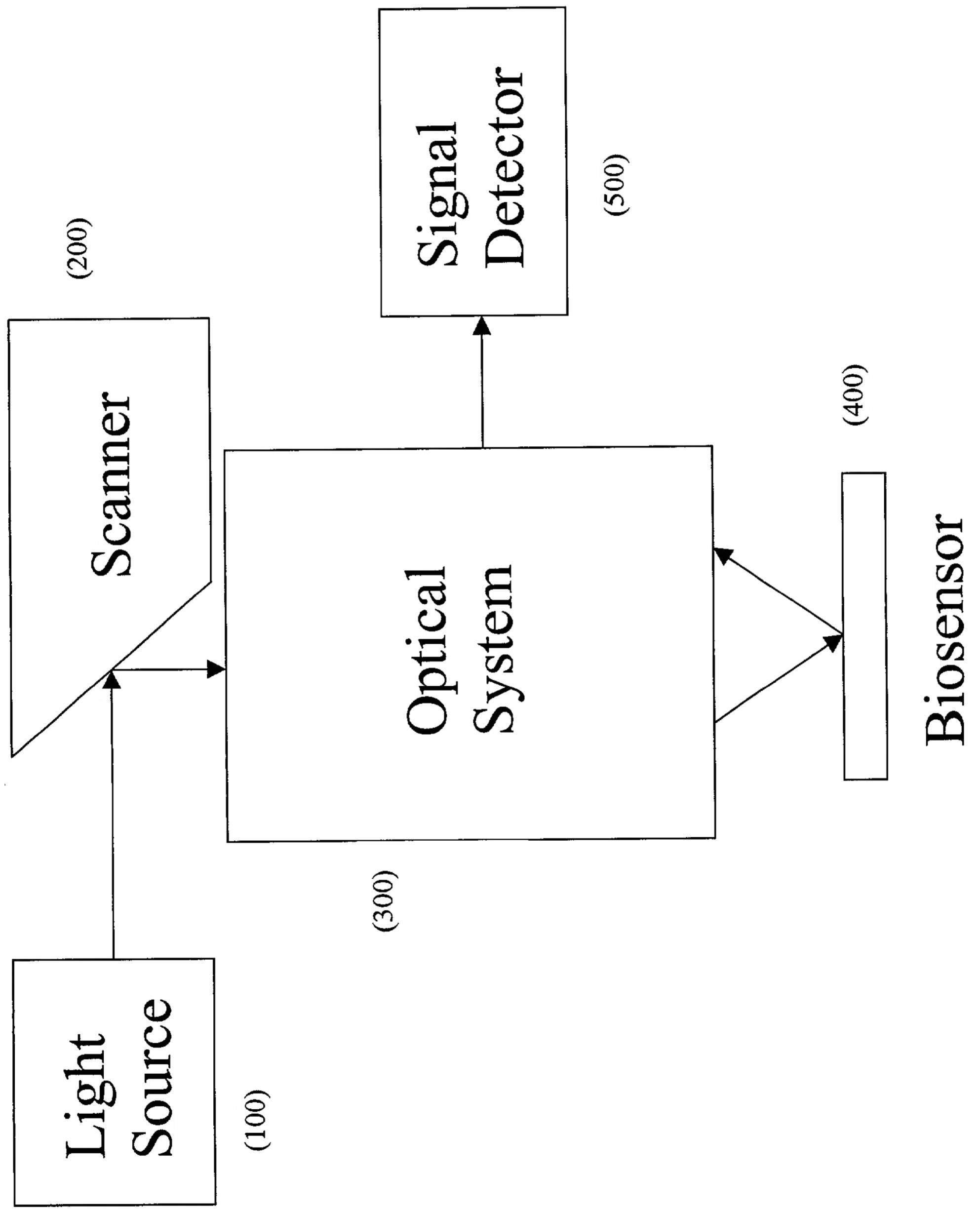


Figure 52